

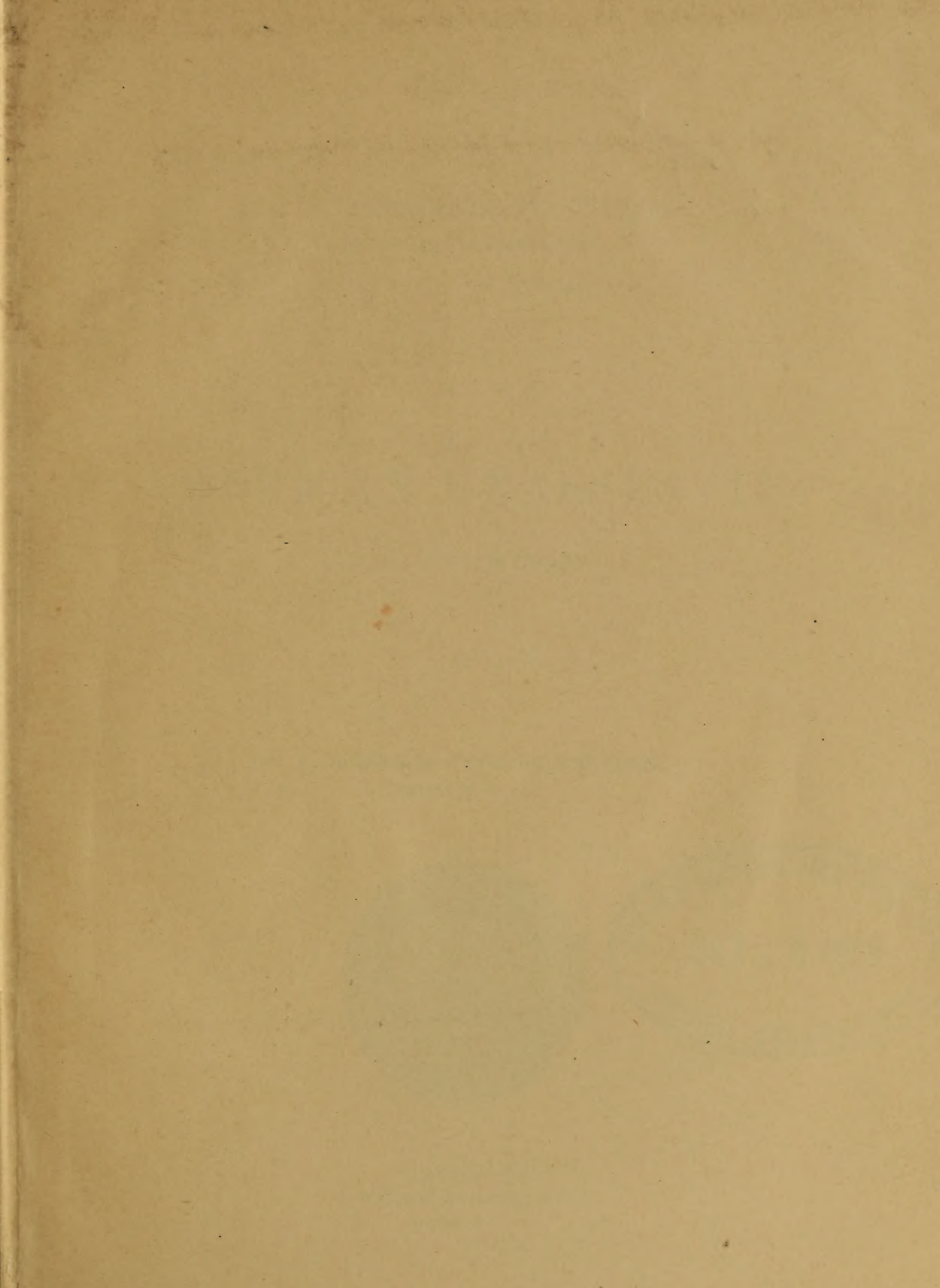
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BULLETIN No. 17.

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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

AMERICAN GRASSES—II.

(ILLUSTRATED.)

BY

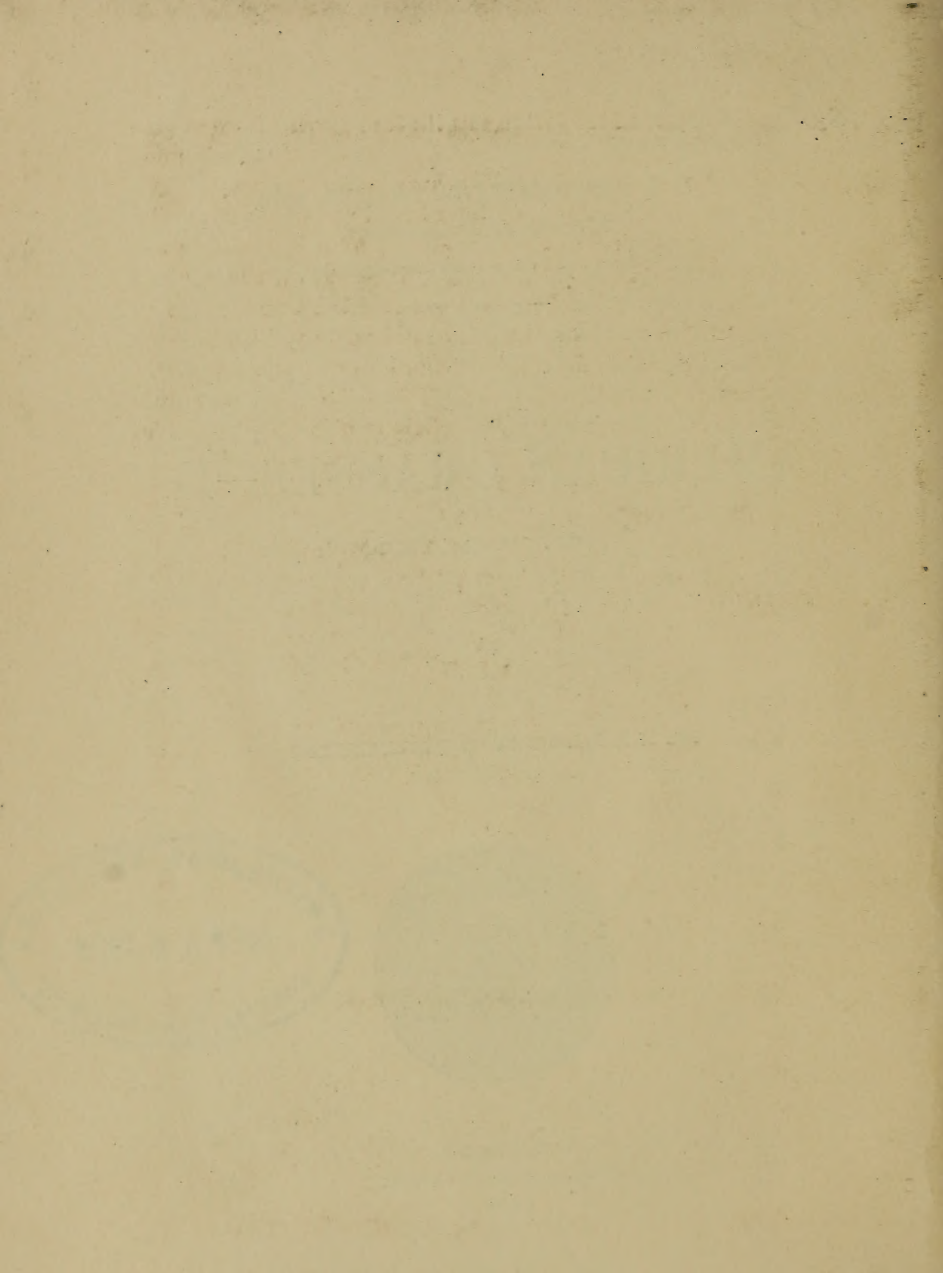
F. LAMSON-SCRIBNER,

AGROSTOLOGIST.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1899.



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J.D.S.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF AGROSTOLOGY,
Washington, D. C., April 8, 1899.

SIR: I have the honor to transmit herewith the manuscript and illustrations for "American Grasses—II," and recommend its publication as Bulletin No. 17 of this Division. "American Grasses—I" was published as Bulletin No. 7, and contained illustrations of 302 species. In this second part 325 additional species are described and illustrated, making a total of 627 species. Many of our grasses are here illustrated for the first time, and as a whole it is believed that the work will be helpful to students of grasses in determining the species of this most important family of plants. In the preparation of this part more attention has been given to synonymy and to the citation of authorities, and the descriptions have been extended in order to facilitate identification.

Of the species now illustrated, 19 may be regarded as characteristic of the Atlantic Coast region, 83 to the region of the Gulf of Mexico, 92 to the Southwest, including the States of Texas, New Mexico, Arizona, and southern California, 74 to the States of California, Oregon, and Washington, and 61 to the Rocky Mountain region, of which 19 may be regarded as more properly the prairie species of that region. The distribution of some of the species is very limited, while that of others

may extend throughout all the States and even to other countries.

The genus *Blepharoneuron* Nash is here recognized, while *Stappia* Davy is referred to *Anthochloa* Nees. A few species are here published for the first time, and a number of those recently described as new, particularly of the genus *Panicum*, are included more for the purpose of calling attention to them than as an expression of the acceptance of their validity. In the two parts eighty-seven species of *Panicum* are illustrated, many of them by drawings made from type specimens.

For information concerning the forage or other economic values of the species described, reference is made to previously published bulletins of the Division, especially to Bulletin No. 14. The illustrations are of the same character as in *American Grasses—I* (Bulletin No. 7), and have been executed by the same artists.

Respectfully,

F. LAMSON-SCRIBNER,

Agrostologist.

Hon. JAMES WILSON,

Secretary of Agriculture.

AMERICAN GRASSES—II.

(ILLUSTRATED.)

BY F. LAMSON-SCRIBNER.

METRIC MEASUREMENTS AND THEIR ENGLISH EQUIVALENTS.

The metric system adopted in this bulletin, as in No. 7, is now quite generally employed in botanical and other scientific publications. For those unfamiliar with this system the following expression of equivalents may be useful:

1 millimètre (1 mm.)=one twenty-fifth of an inch—exactly 0.0394 inch.

1 centimètre (1 cm.)=nearly one-half of an inch; 10 cm.=about 4 inches.

1 décimètre (1 dm.)=about 4 inches, or 3 dm.=1 foot.

1 mètre (1 m.)=about 3 feet $3\frac{3}{8}$ inches—exactly 39.37079 inches.



FIG. 303. *Imperata brasiliensis* Trin. in Mém. Acad. Pétersb. VI, 2: 331 (*I. caudata* Chapm. Fl. S. St. 668, not Trin.). BRAZILIAN BLADY-GRASS.—A rather slender, erect perennial, 3 to 7 dm. high, with narrow, white-hairy panicles, 6 to 12 cm. long, and linear-lanceolate leaves, 10 to 30 cm. long. Spikelets linear, about 4 mm. long, the outer glumes (*b* and *c*) clothed with long hairs from the base to near the middle.—Rich, dry soil, Southern Florida. [Mexico and South America.] May.



FIG. 304. *Erianthus alopecuroides* (L.) Nash in Britt. & Brown, Ill. Flor., 1: 98, not Ell. (*E. contortus* Ell. Sk. Bot. S. Car. & Ga. 1, 40. *E. saccharoides contortus* Hack.) SPIRAL-AWNED PLUME-GRASS.—A stout, erect perennial, 2 to 3 m. high, with long leaves and hairy, bearded panicles 15 to 30 cm. long. Spikelets (*a*) 6 to 7 mm. long; the deeply cleft fourth or flowering glume (*e*) with a stout, twisted awn 14 to 18 mm. long; hairs as long as or exceeding the spikelet.—Low moist grounds, New Jersey to South Carolina and westward to Texas. September.

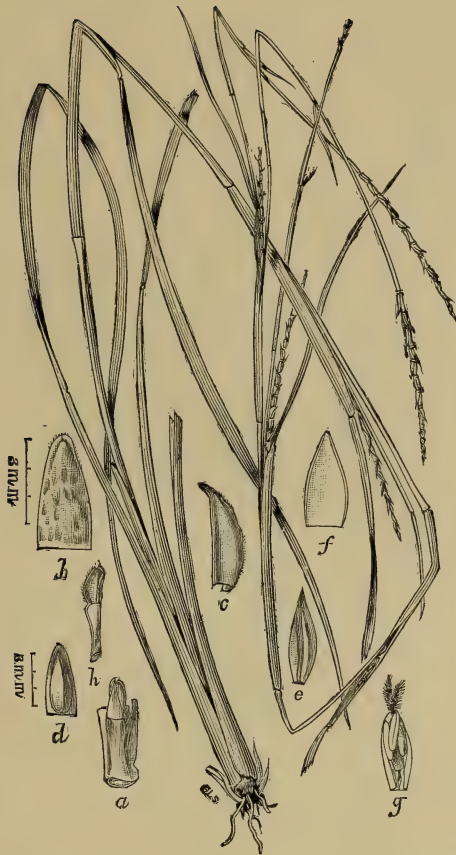


FIG. 305. *Manisuris corrugata* (Baldw.) Kuntze. (*Rottboellia corrugata* Baldw. in Sill. Journ. 1: 355. 1819.) TALL RAT-TAIL-GRASS.—A stout, erect perennial, 1 m. or more high, with flattened culms and sheaths, subcylindrical, spike-like racemes, 6 to 8 cm. long, terminating the branches from the upper joints of the culm. Sessile spikelets, 5 to 6 mm. long, with transverse ridges and irregular depressions on the back of the first glume (*b*).—Swamps and wet pine barrens, Fla. to Miss. Sept., Oct.



FIG. 306. *Manisuris rugosa* (Nutt.) Kuntze, Rev. Gen. Pl. 2: 780. 1891. (*Rottboellia rugosa* Nutt. Gen. 1: 84.) ROUGH-FLOWERED RAT-TAIL-GRASS.—A rather stout perennial, with compressed culms 1 to 2 m. high, narrow leaves 30 to 50 cm. long, and slender terminal and axillary racemes 4 to 5 cm. long. Outer glume of the sessile spikelet about 4 mm. long and strongly transversely rugose.—In moist or wet soil from Delaware to Florida and Alabama, and westward to Texas, chiefly near the coast. August-October.



FIG. 307. *Manisuris cylindrica* (Michx.) Kuntze, Rev. Gen., Pl. 779. 1891. (*Tripsacum cylindricum* Michx.; *Rottboellia cylindrica* Torr., Chapm.). **SLENDER RAT-TAIL-GRASS.**—A slender perennial with nearly terete, erect culms 60 to 90 cm. high, narrow leaves 15 to 30 cm. long, and cylindrical spike-like racemes 12 to 18 cm. long. Sessile spikelet (*b*) 6 to 7 mm., long with the first glume (*c*) firm in texture and slightly pitted on the back.—Prairies, Florida to Arkansas, Oklahoma, Indian Territory, and Texas. June–September.



FIG. 308. *Elionurus tripsacoides* Humb. et Bonpl. ap. Willd. Sp. Pl. 4: 941. 1805. (*Rottboellia ciliata* Nutt.) Astout, branching perennial 7 to 12 dm. high, with narrow leaves 15 to 50 cm. long, and slender, more or less pilose racemes 8 to 14 cm. in length. Sessile spikelet lanceolate, 7 to 10 mm. long, with the first glume (c) glabrous on the back or shortly pubescent near the base.—Low pine barrens and marshy grounds, Florida to Texas. [South America.] August, September.



FIG. 309. *Andropogon tener* Kunth, Revis. Gram. 2: 565.
 BEARDLESS BROOM SEDGE.—A slender perennial grass 2 to 6 dm.
 high, with long, narrow leaves, and very slender racemes 3 to 6 cm.
 long. Sessile spikelet (*a*) 4 to 5 mm. long, with the ciliate and
 deeply cleft fourth glume (*f*) bearing a slender awn 8 to 14 mm.
 long.—Dry sandy hills and pine barrens, Florida, Alabama, and
 Mississippi to New Mexico. [Cuba, Mexico.] July–September.



FIG. 310. *Andropogon semiberbis* Kunth, Enum. 1: 489. (*A. tener* Curtiss, N. Am. Pl. No. 3633, not Kunth.) SHORT-BEARDED BROOM SEDGE.—A rather stout, caespitose perennial 6 to 10 dm. high, with narrow leaves and slender racemes 8 to 12 cm. long. Sessile spikelet (*a*) 7 to 8 mm. long, with the slender awn of the deeply cleft fourth glume (*e*) 10 to 16 mm. long.—Florida to New Mexico and Nevada. [Cuba, Puerto Rico.] September–April.



FIG. 311. *Andropogon hirtiflorus oligostachyus* (Chapm.) Hack. in D. C. Monog. Phan. 6: 372. (*Andropogon oligostachyus* Chapm.) A slender perennial 6 to 12 dm. high, with narrow leaves and slender racemes 5 to 6 cm. long. Sessile spikelet (*a*) 6 to 7 mm. long with the first glume (*b*) hirsute, and the deeply cleft fourth glume (*e*) bearing a slender, geniculate awn about 15 mm. long. Florida, Arizona. [St. Domingo and Mexico.] July-September.



FIG. 312. *Andropogon gracilis* Spreng. Syst. 1:284, not Presl. SLENDER BROOM SEDGE.—A slender, erect perennial 3 to 4 dm. high, with thread-like leaves 10 to 20 cm. long and terminal, silky-hairy racemes 3 to 5 cm. long. Sessile spikelet (a) 4 to 6 mm. long, with the awn of the flowering glume (e) 13 to 19 mm. long.—Dry pine woods, Southern Florida. [West Indies.] June-August.



FIG. 313. *Andropogon virginicus tetrastachys* (Ell.) Hack. in DC. Monog. Phan. Prod. 6; 411. (*A. tetrastachys* Ell. *A. curtissianum* Steud.) MANY-FLOWERED BROOM SEDGE.—A tall, slender variety with the leaf-sheaths often villous above and the lower leaves very villous. Panicles 30 to 50 cm. long, sessile spikelets 4 to 4.5 mm. long, awns 16 to 20 mm. long.—Moist pine barrens and old fields, Florida, Alabama to Mississippi. September, October.



FIG. 314. *Andropogon mohrii* Hack. Contrib. U. S. Nat. Herb. 3: 11. 1892. (*A. liebmanni mohrii* Hack. in DC. *Monogr. Phan.* 6: 413. 1889.) MOHR'S BROOM SEDGE.—A stout, erect perennial, 10 to 15 dm. high, with densely villous sheaths and leaves, and lax panicles 50 to 60 cm. long. Sessile spikelets about 4 mm. long, with the narrow fourth glume bearing a slender awn about 20 mm. long.—Low pine barrens, Alabama, Mississippi, and Louisiana. October, November.



FIG. 315. *Andropogon longiberbis* Hack. Flora, **68**: 131. 1885. (*A. tetrastachyus* var. *distachyus* Chapm.) LONG-BEARDED BROOM SEDGE.—A slender grass, 6 to 8 dm. high, with compressed, silky-villous sheaths, comparatively short and narrow leaves and slender panicles, 20 to 30 cm. long. Racemes 3 cm. long. Sessile spikelets 4 to 4.5 mm. long, somewhat broader than in *A. virginicus*, with the shortly 2-toothed fourth glume (*e*) bearing a slender awn about 16 mm. long.—High pine lands, Florida. May, June.



FIG. 316. *Andropogon brachystachys* Chapm. Fl. S. St. Suppl. 668. SHORT-SPIKED BROOM SEDGE.—A stout, erect perennial 12 to 15 dm. high, with rather long, very smooth leaves and narrow, much branched panicles 60 to 70 cm. long. Racemes in pairs, 1.5 to 2 cm. long. Sessile spikelet narrow-lanceolate, about 5 mm. long with the first glume (*b*) very acute, the fourth glume (*e*) bearing a slender awn 7 to 8 mm. long.—Pine barrens, Florida. September, October.



FIG. 317. *Andropogon glomeratus* (Walt.) B. S. P. (*Cinna glomerata* Walt. Flor. Car. 39. 1788; *A. macrourus* Michx.) BROOK-GRASS.—A stout perennial 6 to 12 dm. high. Fertile spikelets 4 mm. long.—Low grounds New York to Florida, westward to Texas, New Mexico, and Nevada. [Mexico, Lower California, Cuba, and Jamaica.] September–November. NOTE.—Another form of this species is figured in Bull. 7.



FIG. 318. *Andropogon maritimus* Chapm. Fl. S. St. Suppl. 668. (*A. scoparius maritimus* Hack.) SAND BROOM SEDGE.—A rather slender perennial, with numerous, abruptly reflexed and glabrous leaves 5 to 10 cm. long, and stout racemes 4 to 5 cm. long; sessile spikelets 10 mm. long, with the bifid fourth glume (*c*) bearing an awn about 13 mm. long.—Sand dunes along the coast, west Florida to Mississippi. September–November.

A good sand binder. Allied to *A. scoparius*, but quite distinct.



FIG. 319. *Andropogon hallii* Hack. Sitzungsber. Ak. Wiss. Wien, **89**: 127. 1884. COLORADO SAND-GRASS.—A stout, glabrous perennial 4 to 10 dm. or more high, with rather long (the lower 10 to 20 cm.), flat leaves and stout racemes which are in pairs or in threes and 5 to 8 cm. long. Sessile spikelet (*a*) about 8 mm. long, with the first glume (*b*) ciliate along the keels and pilose-hairy toward the apex. Awn shorter than the spikelet or wanting.—Dry sandy soil, North Dakota, Montana, southward to Kansas, Texas, and New Mexico. [Mexico.] July–September.

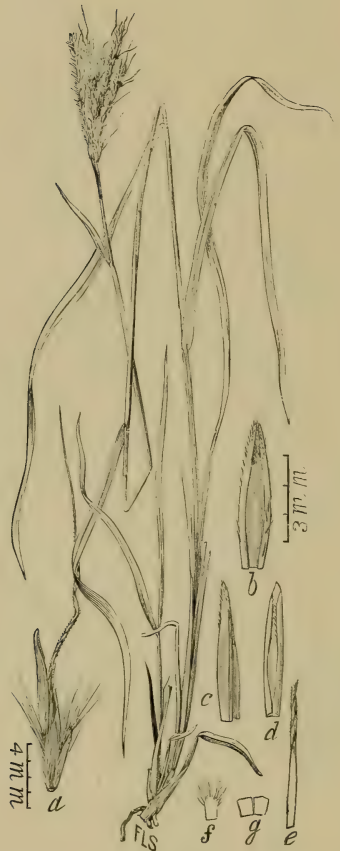


FIG. 320. *Andropogon wrightii* Hack. in *Flora*, **68**: 139. 1885.
 WRIGHT'S BROOM SEDGE.—A slender, erect perennial 5 to 8 dm.
 high, with long, flat leaves 15 to 20 cm. long, and 3 to 4 digitate
 or subfastigate racemes about 4 cm. long. Sessile spikelet
 5.5 to 6 mm. long, with the very narrow fourth glume (*e*) bearing
 a slender awn 12 to 13 mm. long.—Dry mesas, New Mexico.
 [Mexico.]



FIG. 321. *Andropogon halepensis* Brot. (*Sorghum halepense* Pers; *Holcus halepensis* Linn. Sp. Pl. Ed. 1, 1047.) JOHNSON GRASS.—A stout, smooth, erect perennial 1 to 2 m. high, from strong, creeping rootstocks, with long, flat leaves, 1 to 2 cm. broad, and open panicles 15 to 30 cm. long. Sessile spikelets (a) 4 to 5.5 mm. long, the awn of the flowering glume 10 to 15 mm. long.—Introduced and cultivated in many of the Southern States for hay. [Southern Europe, Asia, and North Africa.]



FIG. 322. *Andropogon contortus* Linn. Sp. Pl. ed. 1, 1045.
 TWISTED BEARD-GRASS.—A stout perennial 4 to 10 dm. high, with rather broad leaves and solitary, bearded racemes, terminating the culm or its branches. Racemes about 5 cm. long. Sessile spikelet 9 to 10 mm. long, pubescent. Awns twisted 8 to 10 cm. long.—Sandy soil, Texas to Arizona. [Tropical and subtropical countries of both hemispheres.] April–October.



FIG. 323. **Andropogon melanocarpus** Ell. Sk. Bot. S. Car. & Ga., 1 : 146. 1817. (*Stipa melanocarpa* Muhl.) LARGE-FRUITED BEARD-GRASS.—A stout, branching annual with slightly compressed culms, 5 to 20 dm. high, leaves 15 to 40 cm. long, 0.5 to 1 cm. wide, and terminal or lateral racemes 4 to 6 cm. long. Sessile spikelet (*b*) 7 to 9 mm. long with a sharp barbate callus 3 mm. long, and a stout, densely villous awn 8 to 12 cm. long.—Fields and roadsides, Florida to Alabama. [Throughout the tropics.]

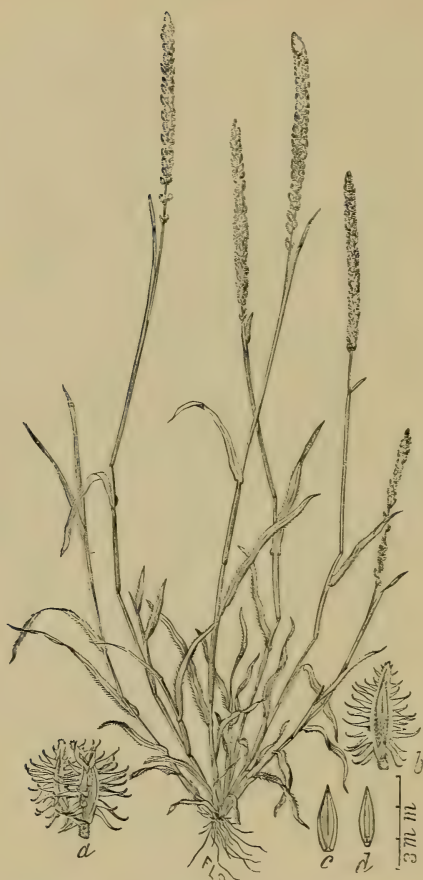


FIG. 324. *Nazia aliena* (Spreng.). (*Lappago aliena* Spreng. Neue Entd. 3:15. 1822. *Tragus occidentalis* Nees.; *Nazia racemosa aliena* Scribn. & Smith, Dept. Agr. Div. Agros. Bull. 4.) WESTERN PRICKLE-GRASS.—A rather slender and diffusely branching annual 1 to 3 dm. high, with spreading, flat leaves, slender spike-like racemes and hard spikelets, the second glume being covered with rigid hooked prickles.—Dry, rocky hillsides, Texas, New Mexico, and Arizona. [Mexico, West Indies, and South America.]



FIG. 325. *Paspalum mucronatum* Muhl. Cat. 8, 1813. (*P. fluitans* Kunth.) FLOATING WATER-GRASS.—An aquatic with much branched, ascending culms from a creeping or floating base, 1.5 to 10 dm. long, and 10 to 50 slender racemes 2 to 6 cm. long. Spikelets in 2 series, subacute, 1.5 mm. long.—Southern Illinois to Florida, Louisiana, Indian Territory, and Texas. [Tropical America.] July–October.



FIG. 326. *Paspalum membranaceum* Walt. Fl. Carol. 75. 1788. Not Lam. (*P. walterianum* Schultes.) WALTER'S PASPALUM.—A low, creeping, semiaquatic grass, with much branched, smooth stems 1.5 to 4.5 dm. long, short, flat leaves and 2 to 6 small racemes, 1 to 2 cm. long. Spikelets ovate, obtuse, about 2 mm. long, crowded in 2 rows on one side of the broad (2 to 3 mm.), flat rachis.—Wet soil, New Jersey and Delaware, south to Florida and westward to southern Ohio and Texas. [Cuba.] July–October.



FIG. 327. *Paspalum boscianum* Flügge, Monog. 170. 1810. (*P. purpurascens* Ell.; *P. virgatum* Walt. not Linn.) PURPLE PASPALUM.—A stout perennial with ascending, branching culms 6 to 9 dm. high, long, flat leaves and numerous, usually purple-flowered racemes 2 to 6 cm. long, crowded near the summit of the culm or its branches. Spikelets glabrous, obovate, obtuse, 2 mm. long.—Low woodlands and along ditches, North Carolina and Tennessee to Florida westward to Mississippi and Louisiana. July–September.

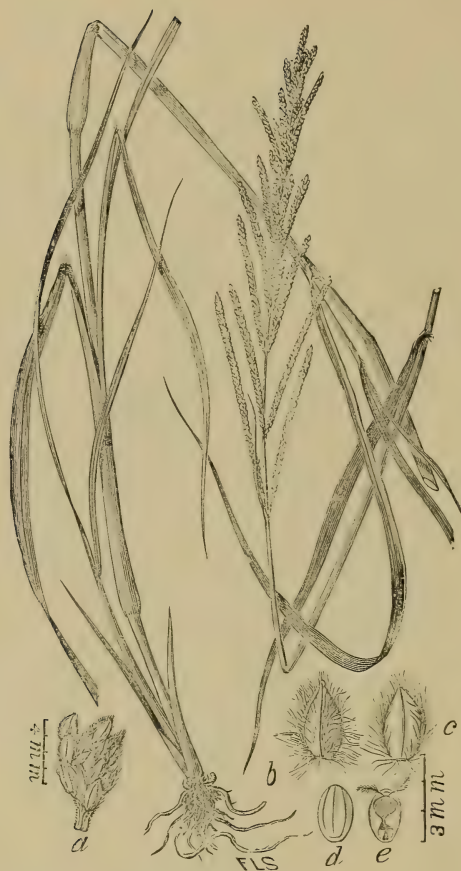


FIG. 328. *Paspalum vaseyanum* Scribn. n. sp. (*P. virgatum pubiflorum* Vasey, not *Paspalum pubiflorum* Rupr.) VASEY'S PASPALUM.—A rather stout, erect perennial 9 to 18 dm. high, with long, flat, glabrous leaves and 12 to 20 ascending racemes 5 to 10 cm. long. Spikelets ovate, 2 to 2.5 mm. long, the acute outer glumes long-hairy on the margins, the first thinly hairy all over.—Along ditches, roadsides, and in old fields, Louisiana to Texas. July–September.



FIG. 329. *Paspalum curtissianum* Steud. Syn. Pl. Glum. 1 : 26. 1855. CURTISS' PASPALUM.—A coarse, erect perennial 9 to 17 dm. high with the lower sheaths usually densely villous, long, flat leaves, and 3 to 8 spikes 4 to 10 cm. long. Spikelets (*c*, *b*) nearly orbicular in their outline, strongly compressed on the back, about 3 mm. long.—Damp pine barrens, Florida to Mississippi. July, August. No. 4990, A. H. Curtiss. 1894, and 3865, S. M. Tracy.



FIG. 330. *Paspalum lividum* Trin. MS. Schlecht in *Linnaea*, **26**: 383. 1853-55; Vasey, *Bull. Torr. Bot. Club*, **13**: 164; *Contrib. U. S. Nat. Herb.*, **3**: 18.—A rather slender, caespitose perennial with very sharp-pointed, usually erect leaves and 4 to 8 approximate, usually somewhat curved racemes 2 to 3 cm. long. Spikelets crowded, obovate, subacute, 2 to 3 mm. long.—Low grounds, Texas.
Plant often geniculate, more or less creeping at the base.



FIG. 331. *Paspalum scrobiculatum* Linn. Mant. 1:29. 1767. Trin. Icon. Gram. t. 143. DITCH MILLET.—A densely caespitose perennial, 2 to 6 dm. high, with rather soft culms often geniculate at the lower joints; narrow, flat leaves and 2 to 5 racemes approximate near the summit of the culm or its branches, 2 to 4 cm. long. Spikelets (*b*, *c*) rounded, obtuse, 2 to 3 mm. long.—Wet places, Florida (No. 5760, Curtiss, 1896). [Tropical countries of both hemispheres.] August, September.



FIG. 332. *Paspalum blodgettii*, Chapm. Flor. So. U. S. 571.— A slender, densely caespitose, erect perennial, 4 to 10 dm. high, with flat, glabrous, thin leaves and slender racemes 2 to 4 cm. long. Spikelets (*b*, *c*) elliptical-oblong, obtuse, about 1.7 mm. long, with the 3-nerved outer glumes thinly and minutely pubescent. Florida.

Very variable as to the length of leaves.



FIG. 333. *Paspalum giganteum* Vasey, Descrip. Cat. 6; Bull. Torr. Bot. Club, **13** : 166. 1886. GIANT WATER-GRASS.—A stout, erect perennial, 8 to 16 dm. high, with broad (often 2 to 3 cm.), flat leaves, and 2 to 5 racemes, 15 to 25 cm. long. Spikelets (*b*, *c*) crowded, plano-convex, obtuse, about 3 mm. long.—Moist grounds and ditches, Florida. June–August.



FIG. 334. *Paspalum bifidum* (A. Bertol.) Nash. 1897. (*Paspalum racemulosum* Chapm.) LOOSELY-FLOWERED PASPALUM.—A slender, erect perennial 6 to 12 dm. high, long, flat leaves, villous sheaths, at least the lower ones, and slender, rather remotely flowered racemes 5 to 12 cm. long. Spikelets (*a*, *b*) on comparatively long pedicels, obovate, obtuse, about 3 mm. long.—Dry, sandy soil, pine barrens of Alabama and Florida westward to Louisiana and Texas. August–October.



FIG. 335. *Paspalum monostachyum* Vasey in Chapm. Fl. S. States, Suppl. 665; Bull. Torr. Bot. Club, **13**:163. 1886. A rigid, erect perennial 6 to 10 dm. high, from a creeping rootstock, with very long, narrow, involute leaves, the lower ones often 3 to 6 dm. long, and one (rarely two) terminal raceme 15 to 20 cm. long. Spikelets crowded, oblong, obtuse, 3 mm. long.—Low grounds, Florida to Texas.



FIG. 336. *Anthenanthera rufa* (Ell.) Schultes, Mant. 2: 258. (*Aulacanthus rufus* Ell. Bot.: 103. *Panicum rufum* Kunth.) RED-HAIRED ANTHERANTIA.—A slender, erect, glabrous and rather rigid perennial 3 to 8 dm. high, from creeping rootstocks, with narrow, green, or often rufous, rather loosely flowered panicle 8 to 15 cm. long. Spikelets (a) 3 mm. long, villous, with spreading hairs on the outer glumes.—Moist, sandy soil, pine barrens, North Carolina to Florida and westward to Texas. August–October.



FIG. 337. *Anthenantia villosa* (Michx.) Benth. (*Phalaris villosa* Michx. Fl. 1 : 43. 1803. *Panicum ignoratum* Kunth.)—An erect, somewhat wiry perennial, 6 to 12 dm. high, from strong, creeping rootstocks, with flat, rather short leaves, and loosely flowered panicles, 10 to 20 cm. long. Spikelets (a) about 3 mm. long, outer glumes villous with spreading hairs.—Dry sandy soil, in open pine barrens, etc., South Carolina to Florida and westward to Louisiana and Texas. July–October.



FIG. 338. *Eriochloa sericea* Munro, MS.; Vasey Contrib. U. S. Natl. Herb., 3: 21, and Ill. N. Am. Grasses, Part I, t. 1. SILKY EVER-LASTING-GRASS.—A slender, erect, tufted perennial 3 to 10 dm. high, with numerous basal leaves and slender, simple, racemose panicles. Spikelets (*b* and *c*) elliptical-oblong, acute, 3 to 4 mm. long, imbricate in two rows along one side of the flat rachis; outer glumes silky-villous. Pedicels bearing hairs as long as the spikelets.—Dry soils, Texas to Arizona. September.



FIG. 339. *Panicum sanguinale* Linn. Sp. Pl. 84. 1753. (*Digitaria sanguinalis* Scop.; *Syntherisma praeox* Walt.) CRAB-GRASS.—A much-branched, leafy annual, more or less decumbent and rooting at the lower nodes. Stems 3 to 9 or 12 dm. long, nodes and sheaths usually hairy. Spikelets 2.5 to 3 mm. long, in digitate or subfasciculate racemes, which are 5 to 18 cm. long.—A weed in cultivated fields and lawns. [Warmer temperate regions of both hemispheres.] June–September.



FIG. 340. *Panicum platyphyllum* Munro, ex Wright in Sauv. Fl. Cub. 197, without description; Vasey in Contrib. U. S. Natl. Herb., 3:27. **FLAT-LEAFED PANIC-GRASS.**—A much-branched, ascending, leafy perennial, rooting at the lower joints; flowering stems 3 to 5 dm. high. Spikelets (*a*, *b*, *c*) broadly ovate, oblong, obtuse, about 4 mm. long, arranged in slender, spike-like racemes, which are approximate near the apex of the culm or its branches. — Low grounds, Texas. [Cuba.] June, July.



FIG. 341. **Panicum prostratum** Linn., Sp. Pl. 87; Chapm. Fl. S. States, Suppl. 666. LOW PANIC-GRASS.—A slender, creeping, and much-branched perennial, with short, ciliate leaves and terminal panicles composed of 5 to 10 simple racemes. Spikelets (*a*, *b*, *c*) ovate-oblong, glabrous, about 2 mm. long.—Moist or wet grounds, New Jersey (ballast), Alabama to Florida, and westward to Louisiana and eastern Texas. [Tropical countries of both hemispheres.] September.



FIG. 342. *Panicum saccharatum* Buckl. Prel. Rep. Geol. and Agr. Surv. Tex. 2. 1866. (*P. lachnanthum* Torr, 1857, not Hochst. 1855). ARIZONA COTTON-GRASS.—A leafy, erect perennial, 3 to 9 dm. high, usually much-branched below; culms terminated by narrow panicles 10 to 20 cm. long. Spikelets (*a*, *b*) about 3 mm. long, densely silky-villous, the spreading hairs nearly 3 to 4 mm. long.—Dry hillsides, canyons, etc., southern Colorado, Texas, New Mexico, and Arizona.



FIG. 343. *Panicum tenerrimum* (Nees) Kunth, Gram. 1 : 39. (*Trichachne tenuis* Nees.) SLENDER WOOLLY PANIC.—A slender, erect, branching, and leafy perennial (?) 2 to 5 dm. high, with short and rather rigid flat leaves, and simple panicles about 10 cm. long. Spikelets (*a*, *b*, *c*) 2 mm. long; the first glume glabrous; the second and third glumes densely clothed with short, silky hairs.—Low grounds, Texas (Pecos County); rare. September, October.



FIG. 344. *Panicum ciliatissimum* Buckl. Buckl. Prel. Rep. Geol. and Agr. Surv. Tex. 4. 1866. Vasey, U. S. Dept. Agr., Div. Bot., Bull. 8:28. 1889. INDIAN WHEAT. CARPET GRASS.—A creeping, much branched, leafy perennial with upright flowering stems 1 to 3 dm. high and narrow few-flowered panicles 2 to 4 cm. long. Spikelets (*a, b*) about 3.5 to 4 mm. long, with the second and third glumes densely ciliate-hairy near the margins.—Low grounds, southern Texas. May.

This grass is locally known as carpet grass. The extensively creeping, short-jointed, and leafy stems of this grass suggest a close resemblance to Bermuda grass.



FIG. 345. *Panicum urvilleanum* Kunth, Revis. Gram., 1 : 35 et 2 : tab. 115. WOOLLY-FLOWERED PANIC.—A stout, erect perennial 3 to 5 dm. high, with long, flat leaves and open panicles 15 to 25 cm. long. Spikelets (*a*, *b*, *c*) 4 to 6 mm. long, ovate, the outer glumes clothed with rather long hairs. Whole plant more or less hairy.—Sandy soil, southern California. [South America.] March–June.



FIG. 346. *Panicum flexile* (Gattinger) Scribn. Bull. Torr. Bot. Club. 20: 476. 1893. (*P. capillare* var. *flexile* Gattinger, Tenn. Fl. 94. 1887.) WIRY PANIC-GRASS.—A rather slender, erect annual, 3 to 6 dm. high, branching at the base, with flat leaves, capillary panicles, and rather distant, acute spikelets (*a*, *b*, *c*), 3 mm. long. In both moist and dry sandy soils, Pennsylvania and Michigan, southward to Florida and Mississippi. July–October.



FIG. 347. *Panicum cognatum* Schultes, Mant. 2: 235. 1824. (*P. divergens* Muhl. 1817, not H. B. K. 1815; *P. autumnale* Bosc. 1825.) FALL WITCH-GRASS.—A slender, erect, or ascending perennial, usually much branched at the base, 3 to 6 dm. high, with rather short, narrow leaves, diffusely branching panicles, and acute, lanceolate spikelets (*a*, *b*, *c*) about 3 mm. long.—Dry soil, South Carolina and Florida to Illinois, Minnesota, Kansas, and Arizona. June–October.



FIG. 348. *Panicum capillarioides* Vasey, Contr. U. S. Nat. Herb. 1: 54. 1890. TEXAS WITCH-GRASS.—An erect, more or less branching perennial, 2.5 to 5 dm. tall, with narrow and more or less elongated, flat leaves and diffuse panicles 15 cm. long. Spikelets (*a*, *b*) narrowly lanceolate, acute, 5 to 6 mm. long.—San Diego and Pt. Isabel, Texas. May.



FIG. 349. *Panicum minus* Nash, Bull. Torr. Bot. Club, **22**: 421. *P. capillare* var. *minimum* Scribn. Bull. Tenn. Agr. Exp. Sta. **7**: 44, fig. 39). SMALL WITCH-GRASS.—A slender annual, rarely more than 3 dm. high, with long-pilose sheaths, narrow, flat leaves and oval or pyramidal, few-flowered panicles 8 to 16 cm. long. Spikelets (*a, b, c*) about 1.5 mm. long.—Dry, open woodlands and thickets, New Brunswick southward to Georgia and westward to Wisconsin and Alabama. August, September.



FIG. 350. *Panicum capillare* Linn. Sp. Pl. 86. OLD WITCH-GRASS OR FOOL HAY.—An annual with usually coarse, branching stems 3 to 9 dm. high, hairy or hirsute sheaths, and widely spreading capillary panicles 6 to 24 cm. long. Spikelets (*a*, *b*, *c*) acute, smooth, about 2 mm. long.—A weed in cultivated fields, specially in sandy soils. Maine and Nova Scotia to British Columbia, southward to Florida and Texas. [Europe.] July–October.



FIG. 351. *Panicum hirticaulum* J. S. Presl in Rel. Haenk. 1: 308. 1830. ROUGH PANIC-GRASS.—A slender, or occasionally rather stout, erect perennial, often geniculate at the lower nodes, with papillate-pilose sheaths, flat and usually glabrous leaves and terminal, more or less spreading, many-flowered panicles. Spikelets (*a*, *b*, *c*) lanceolate, acute, about 3 mm. long, glabrous.—Texas, New Mexico, and Arizona to Washington. [Mexico, Galapagos Islands]. August, September.



FIG. 352. *Panicum elongatum* Pursh, Flor. Am. Sept., 69. 1814. (*Panicum agrostoides* Muhl. 1817.) MUNRO-GRASS.—A stout, erect, glabrous, and branching perennial 9 to 15 dm. high, with long, flat leaves, and pyramidal panicles terminating the culm and its branches. Spikelets (*a*, *b*, *c*) very acute, about 2.5 mm. long, crowded.—Wet meadows and along the banks of streams, New Jersey to North Carolina and Kentucky. August, September.



FIG. 353. *Panicum divaricatum* Linn. Am. Acad., 5: 302. (*P. latifolium* Linn. Sp. Pl. in part.) SMALL CANE.—A coarse, woody, bamboo-like perennial, reclining or climbing over bushes, with usually numerous, short and spreading, flower-bearing branches at the nodes. Leaves lanceolate-acute; panicles simple, few-flowered. Spikelets (*a*, *b*) swollen, about 4 mm. long. Glumes tipped with a tuft of hairs.—Dry woods and thickets, southern Florida [West Indies, Mexico, and tropical America]. March-September.



FIG. 354. *Panicum gymnocarpon* Ell. Bot. S. C. and Ga., 1: 117. Chapm. Flor. S. U. S. 573. MARSH PANIC-GRASS.—A fibrous-rooted, smooth perennial with geniculate, ascending stems 6 to 12 dm. high, with long and rather broad, flat leaves and simple terminal panicles about 30 cm. long. Spikelets (*a*, *b*) lanceolate-acute, about 6 mm. long, arranged along one side of the panicle-branches. Outer glumes much longer than the flowering one.—Low grounds, Georgia and Florida westward to Louisiana and Texas. July-September.



FIG. 355. *Panicum subspicatum* Vasey, U. S. Dept. Agr. Div. Bot., Bull. 8: 25. 1889. NARROW-TOPPED PANIC.—A slender, erect, more or less branching, leafy perennial, 2 to 4 dm. high, with flat, more or less spreading leaves and narrow, nearly simple, terminal panicles, the ultimate branches terminating in a short bristle. Spikelets (*a*, *b*, *c*) about 2.2 mm. long.—Dry, sandy plains, southern Texas. August.



FIG. 356. *Panicum reverchonii* Vasey, U. S. Dept. Agr. Div. Bot., Bull. 8 : 25. 1889. REVERCHON'S PANIC.—A slender, erect, and rather densely caespitose perennial with very narrow, erect leaves and terminal, simple panicles, the appressed branches terminating in short bristles. Spikelets (*a*, *b*) 3.5 to 4 mm. long.—Sandy plains, Texas. June–September.



FIG. 357. *Panicum wrightianum* Scribn., U. S. Dept. Agr. Div. Agros. Bull. 11: 44.—A slender, much branched, leafy perennial, with smooth, delicate panicles 2 to 3 cm. long, and small (hardly 1 mm. long) spikelets (*a*, *b*, *c*), the second and third glumes of which are minutely and densely pubescent. Leaves 1 to 3 cm. long, 2 to 3 mm. wide, minutely pubescent on the under side.—Moist, sandy soil in open pine woodlands, Florida. [Cuba]. July–October.



FIG. 358. *Panicum baldwinii* Scribn. U. S. Dept. Agr. Div. Agros. Bull. 11 : 43. (*Panicum nitidum* var. *minor* Vasey; *P. dichotomum* var. *nitidum* Chapm.).—A densely caespitose, slender, glabrous perennial, 1 to 3 dm. high, with short, narrow, and more or less spreading leaves, ovoid or pyramidal panicles 2 to 4 cm. long, and glabrous, ovoid, or pear-shaped spikelets (*a*, *b*, *c*) about 1 mm. long.—Rather dry, sandy soil, Georgia and Florida to Mississippi. March–August.



FIG. 359. *Panicum albomarginatum* Nash, Bull. Torr. Bot. Club, 24 : 40, 1897.—A slender, erect, glabrous, caespitose perennial, 1.5 to 4.5 dm. high, with short sheaths, comparatively firm, erect leaves 1.5 to 4.5 cm. long, bordered with a conspicuous, serrulate, white margin. Panicles ovate, 2.5 to 4 cm. long, with many obovate, obtuse, minutely pubescent spikelets (*a*, *b*) 1.5 mm. long.—Low pine woodlands and swamps, Pennsylvania and Delaware to Florida and westward to Texas. April–October.



FIG. 360. *Panicum leucothrix* Nash, Bull. Torr. Bot. Club, **24**: 41. 1897.—A slender, erect, or ascending, sparingly branched perennial, 1 to 4.5 dm. high, with short, erect leaves 2 to 6 cm. long, and ovate or oval panicles 2.5 to 6 cm. long. Spikelets (*a*, *b*, *c*) obovate about 0.65 mm. long. Sheaths pubescent, with ascending or closely appressed, long, white hairs.—Sandy soil in low pine barrens and cypress swamps, southern Florida. April–July.



FIG. 361. *Panicum erectifolium* Nash, Bull. Torr. Bot. Club, 23: 148. 1896. (*P. sphaerocarpon floridanum* Vasey not *P. floridanum* Trin.)—A rather stout, glabrous perennial, 4 to 6 dm. high, with erect and rather rigid leaves, and terminal, finally exserted, many-flowered, ovate or oblong panicles, 7 to 12 cm. long. Spikelets (*a, b, c*) about 1.5 mm. long, the second and third glumes minutely pubescent.—Swamps, Florida. March–July.

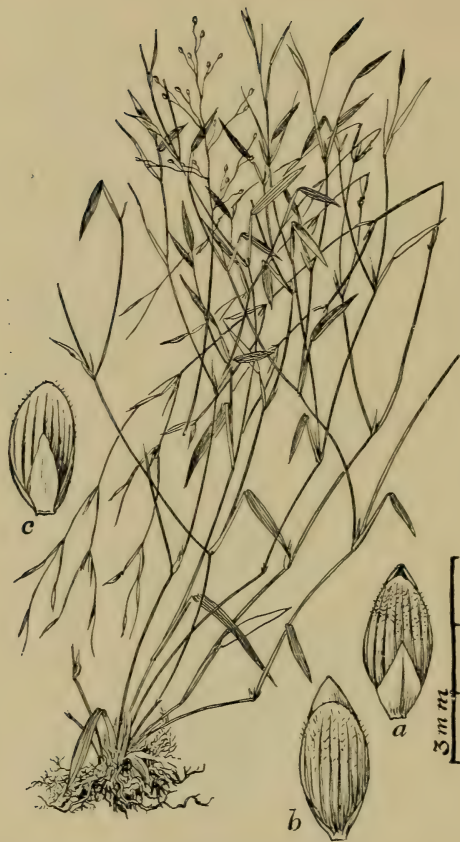


FIG. 362. *Panicum sphagnicolum* Nash, Bull. Torr. Bot. Club, 22 : 422. 1895.—A very slender, ascending or reclining perennial, 4 to 10 dm. high, at first simple, finally becoming much branched, with spreading, smooth leaves 4 to 8 cm. long, and small spreading panicles 4 to 5 cm. long. Spikelets (*a, b, c*) 2.5 to 3 mm. long, with the second and third glumes minutely pubescent, at least near the apex.—Low, boggy places, chiefly in thickets and stagnant swamps, Florida. June–October.



FIG. 363. *Panicum lucidum* Ashe, Journ. E. Mitch. Sci. Soc. 15: 47. 1898. (*P. ramulosum* Michx.?) A very slender, erect, or reclining, glabrous perennial 3 to 10 dm. high, with rather short (2 to 5 cm.), flat, acute leaves, and small, spreading panicles, 2 to 6 cm. long. Spikelets elliptical-ovate, obtuse, 1.8 mm. long, with the second and third glumes glabrous.—Low woods, New Jersey southward and westward to Texas, common.

Distinguished from *P. sphagnicolum* by its smaller and glabrous spikelets.



FIG. 364. *Panicum wernerii* Scribn. in Britt. & Brown, Ill. Flor. 3:501. 1898.—A slender, erect, glabrous perennial with erect, nearly linear, very acute leaves 5 to 8 cm. long, and open, ovoid or pyramidal panicles 5 to 8 cm. long. Branches of the panicle flexuous. Spikelets obovate or oblong, obtuse, about 2.2 mm. long, the obtuse second and third glumes glabrous or sparsely and minutely pubescent. Ohio.



FIG. 365. *Panicum polyanthes* Schultes, Mant., 2 : 257. 1824. (*P. multiflorum* Ell. 1817, not Poir 1816; *P. microcarpon* Muhl. June, 1817, not ex Elliott Jan., 1817).—A rather stout, erect, and finally sparingly branched, smooth perennial, 3 to 8 dm. high, with broad, spreading leaves, many-flowered panicles, 7 to 18 cm. long, and minutely pubescent, nearly spherical spikelets (*a*, *b*, *c*) about 1.5 mm. long.—Dry open woodlands and occasionally in open grounds, New York southward to Florida and westward to Michigan, Nebraska, and Texas. June–October.



FIG. 366. *Panicum dichotomum* Linn. Sp. Pl. 58.—A slender, smooth, and finally much branched above, somewhat wiry perennial, 2 to 6 dm. high, with pale-green, spreading leaves 4 to 8 cm. long, and open panicles. Lateral panicles small and few-flowered. Spikelets (*a*, *b*, *c*) oblong-elliptical, nearly 2 mm. long, glabrous. The later growth of this species has the aspect of a little tree.—Dry thickets and open woodlands, New York to Nebraska and southward to the Gulf of Mexico. May–October.



FIG. 367. *Panicum pubescens* Lam. Encycl., 4: 748. 1797. Scribn. Grasses of Tennessee, 2: 52, fig. 58, 1894. (*P. villosum* Ell.). A slender, erect, and finally much-branched perennial 1.5 to 5 dm. high, with flat, ascending, and rather firm, narrowly lanceolate, pubescent leaves 5 to 10 cm. long, and diffuse, ovate, or pyramidal panicles bearing obovate spikelets (*a*, *b*, *c*) which are 2 mm. in length.—Dry soil, usually in open woodlands, from New Jersey to South Dakota and southward to the Gulf. May–September.

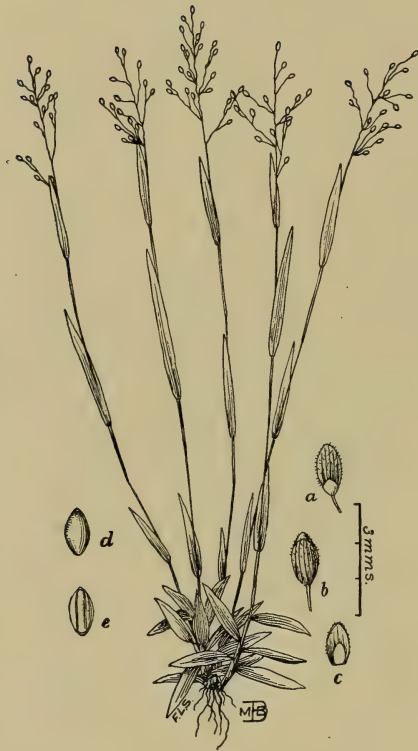


FIG. 368. *Panicum brittoni* Nash, Bull. Torr. Bot. Club, 24: 194. 1897. BRITTON'S PANIC-GRASS.—A slender, erect, caespitose perennial with rigid culms 1 to 2 dm. high, erect leaves, and ovate panicles 2 to 3 cm. long. Spikelets (*a*, *b*) oval or obovoid, obtuse, 1.4 mm. long, with the second and third glumes densely pubescent.—Pine barrens, New Jersey.



FIG. 369. *Panicum octonodum* J. G. Smith, n. sp. A slender, erect, unbranched, glabrous perennial 4 to 6 dm. high, with linear, rigid, erect or ascending leaves, and narrowly pyramidal, rather densely flowered panicles 5 to 10 cm. long; spikelets elliptical-ovate, acute, 1.2 mm. long; second and third glumes faintly 7-nerved and glabrous.—Texas. Allied to *P. lindheimeri* Nash.

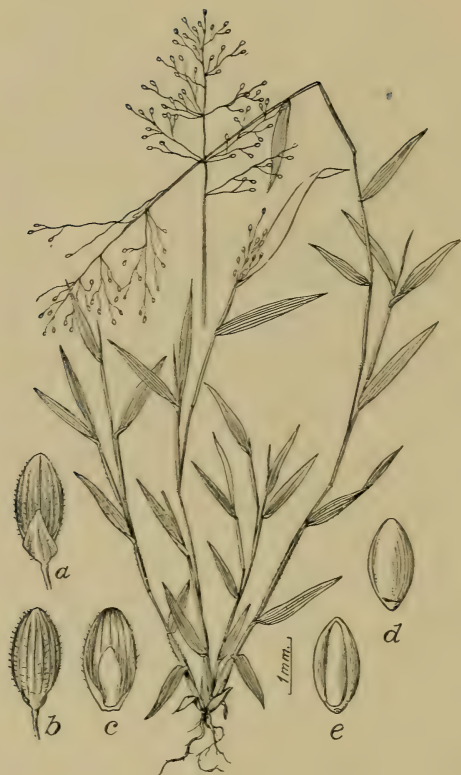


FIG. 370. *Panicum tsugetorum* Nash, Bull. Torr. Bot. Club, 25: 86. 1898.—A slender, tufted, and at length much branched perennial 2 to 4.5 dm. high with the culm, sheaths, and lower surface of the leaves appressed-pubescent, and broadly ovate panicles 4 to 6.5 cm. long. Spikelets (*a, b*) about 1.8 mm. long, broadly obovate, the outer glumes pubescent with short, spreading hairs.—Open woods under evergreens, New York. June–August.



FIG. 371. *Panicum eatoni* Nash, Bull. Torr. Bot. Club, 25: 84. 1898.—A smooth, erect, caespitose perennial, finally much branched, with erect, lanceolate leaves and rather narrow and densely flowered panicles, 7 to 13 cm. long. Spikelets oval-oblong, about 1.6 mm. long, the second and third glumes densely pubescent with spreading hairs.—Maine to New York, near the coast.



FIG. 372. *Panicum atlanticum* Nash, Bull. Torr. Bot. Club, 24: 346. 1897.—A slender, erect, much-branched perennial 3 to 5 dm. high, with the culm, sheaths, and erect, linear-lanceolate leaves, papillate-pilose with long, white, spreading hairs. Panicle 4 to 6.5 cm. long. Spikelets obovate, obtuse, about 2 mm. long, the 9-nerved second and third glumes densely pubescent with short, spreading hairs.—In open woods, Maine to Virginia.



FIG. 373. *Panicum implicatum* Scribn. U. S. Dept. Agr. Div. Agros., Bull. 11: 43. July 20, 1898.—A weak, slender, hairy perennial 3 to 5 dm. high, with rather short, mostly erect leaves and diffusely branching, pyramidal panicles 3 to 5 cm. long. Axis of the panicle and its flexuous branches pilose. Spikelets (*a*, *b*, *c*) 1.5 mm. long, obovate, obtuse, minutely pubescent.—Low grounds near the coast, from Maine to Delaware. June–August.



FIG. 374. *Panicum addisonii* Nash, Bull. Torr. Bot. Club, 25: 83. 1898.—A rather slender, erect, or decumbent, and finally much-branched perennial 2.5 to 4 dm. high, with more or less pubescent sheaths, lanceolate and rather thickish, glabrous leaves, and ovate or oblong panicles 2 to 6 cm. long. Spikelets (*a*, *b*) broadly obovate, 2 mm. long, with the 9- to 11-nerved second and third glumes densely pubescent, with long spreading hairs.—Sandy soil, New Jersey. May-June.



FIG. 375. *Panicum pedicellatum* Vasey, U. S. Dept. Agr. Div. Bot., Bull. 8: 25. 1889.—A slender, erect, or ascending, and finally much-branched perennial 3 to 6 dm. high, with ascending, acute leaves 5 to 8 cm. long, open, few-flowered panicles, and oblong, minutely pubescent spikelets (*a*, *b*, *c*) about 4 mm. in length.—In open, rocky woodlands, Texas. May, June.



FIG. 376. *Panicum rudicaule* Vasey, U. S. Dept. Agr. Div. Bot., Bull. 8:31. 1889.—A slender, erect, smooth perennial, 3 to 6 dm. high, with narrow, lanceolate leaves 5 to 10 cm. long, much-exserted, few-flowered panicles 5 to 8 cm. long, and elliptical-oblong, glabrous spikelets (*a*, *b*) 2 to 5 mm. long.—Swamps, Santa Rosa County, Florida. April, May.



FIG. 377. *Panicum webberianum* Nash, Bull. Torr. Bot. Club, 23: 149. 1896. WEBBER'S PANIC-GRASS.—A rather rigid, erect or ascending and more or less branched perennial 2 to 4 dm. high, with lanceolate, spreading leaves and ovate, spreading panicles 6 to 9 cm. long. Spikelets (*a*, *b*, *c*) elliptic or obovate, 2.5 mm. long with the second and third glumes minutely pubescent, as is the fourth or flowering glume near its obtuse apex.—Low pine lands, Florida. May–August.



FIG. 378. *Panicum laxiflorum* Lam. Encycl. 4: 748. 1797.— A slender, densely tufted perennial about 3 dm. high, with rather long, pale-green, soft leaves and loosely few-flowered panicles 4 to 6 cm. long. Sheaths papillate-pilose with spreading or deflexed hairs. Spikelets (*a*, *b*, *c*) ovate-elliptical, obtuse, about 2 mm. long. Second and third glumes pubescent.—Dry or moist, open woodlands, Virginia to Florida and westward to Tennessee and Louisiana. March–October.



FIG. 379. *Panicum ciliatifolium* Kunth, Revis. Gram. 1: 36. 1835. (*P. ciliatum* Ell. not Thunb.).—A slender, densely tufted perennial 1 to 3 dm. high, with rather short, ciliate leaves and diffuse panicles. Leaves 2 to 6 cm. long, 4 to 12 mm. wide. Panicles ovate-pyramidal, 2 to 3 cm. long. Spikelets (*a*, *b*, *c*) about 2 mm. long, glabrous or minutely pubescent.—Moist open woodlands in sandy soil, North Carolina to Florida and westward to Mississippi. March–October.



FIG. 380. *Panicum polycaulon* Nash, Bull. Torr. Bot. Club. 24: 200. 1897.—A low, pale green, densely caespitose perennial 1 to 2 dm. high, with erect or ascending, oblong-lanceolate leaves 2 to 7 cm. long and ciliate on the margins, and ovate panicles 2 to 3 cm. long. Spikelets (*a, b*) about 1.5 mm. long, obovate, obtuse, the 7-nerved second and third glumes glabrous.—Florida.

This is separated from the closely allied *P. ciliatifolium* Kunth by its narrower leaves, more slender culms, and smaller, glabrous spikelets.



FIG. 381. *Panicum glabrifolium* Nash, Bull. Torr. Bot. Club, 24: 196. 1897.—A slender, densely caespitose, and rigidly erect, wiry perennial 1.5 to 4 dm. high, with narrowly linear, erect, and rather rigid leaves and ovate panicles 4 to 6 cm. long. Spikelets (*a*, *b*) 0.5 to 0.8 mm. long, obovate, the 5-to 7-nerved second and third glumes glabrous.—Florida.



FIG. 382. *Panicum ciliiferum* Nash, Bull. Torr. Bot. Club, 24: 195. 1897.—A densely caespitose, erect, or finally much-branched and decumbent perennial 2 to 8 dm. high, with culms, sheaths, and lower surface of leaves pubescent or hirsute, and broadly ovate panicles 7 to 9 cm. long. Spikelets obovate, subacute, 3 mm. long, the 9-nerved second and third glumes strongly pubescent.—Florida.



FIG. 383. *Panicum manatense* Nash, Bull. Torr. Bot. Club, **24**: 42. 1897.—A glabrous, much-branched perennial with diffusely spreading culms 2 to 4 dm. long, nearly erect leaves 3.5 to 9 cm. long, and ovate, rather few-flowered panicles 4 to 6 cm. long. Spikelets (*a*, *b*, *c*) elliptical-oblong, pubescent, about 3.5 mm. long, with distinct papillæ between the nerves of the second and third glumes.—Florida and (?) Georgia to Louisiana.

Distinguished from *P. commutatum* by its larger and more acute spikelets. Very closely allied to *P. jooirii* Vasey.



FIG. 384. *Panicum enslini* Trin. MSS., Nees, Agros. Bras., 2: 227. 1829. (*P. linearifolium* Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11: 42 Pl. 1.)—A slender, erect, densely caespitose perennial 2 to 4 dm. high, with long, linear-lanceolate, erect leaves and simple, open panicles 5 to 8 cm. long. Spikelets (*a*, *b*) 2 to 2.5 mm. long, obovate, obtuse, with the 7-nerved second and third glumes glabrous or sparingly pilose.—New England southward to Virginia and westward to Texas. To be compared with *P. tenue* Muhl.



FIG. 385. *Panicum depauperatum* Muhl. Gram. 112. 1817.—A slender, erect, or ascending perennial, usually much branched near the base, about 1.5 to 4 dm. high, with very narrow, erect leaves 8 to 20 cm. long, few-flowered narrow panicles 4 to 10 cm. long, and rather smooth spikelets (*a, b, c*) 3 to 4 mm. long.—Open woodlands and gravelly fields from Nova Scotia and Manitoba southward to Florida and Texas. May–August.



FIG. 386. *Panicum viscidum* Ell. Bot. S. Car. & Ga., 1 : 123. 1817. (*P. scoparium* Michx. not Lam.).—A rather stout, erect or ascending, finally much branched perennial, 6 to 12 dm. high. Leaves rather broad, very acute, those on the primary stem 12 to 25 cm. long. Panicle 10 to 15 cm. long, ovate or subpyramidal, many-flowered. Spikelets (*a*, *b*, *c*) 2 mm. long, rounded-obovate, the whole plant, or at least the culm and sheaths densely pubescent with soft, spreading hairs, and all parts somewhat viscid when fresh.—Low ground, borders of thickets, etc., from New Jersey and Delaware southward to Florida and westward to Indiana and Texas. June–October.



FIG. 387. *Panicum scabriusculum* Ell. Sk. Bot. S. Car. & Ga. 1: 121. 1817.—A rather stout, erect, and finally sparingly branched perennial, 9 to 15 dm. high, with narrowly lanceolate leaves 8 to 15 mm. wide and 7 to 20 cm. long. Panicle spreading, 12 to 20 cm. long. Spikelets (*a, b, c*) 2 mm. long, glabrous.—Low grounds, North Carolina to Florida and westward to Texas. May–August.

This species is closely allied to *Panicum ruscidum*.



FIG. 388. *Panicum clandestinum* Linn. Sp. Pl. 58.—A stout, erect or ascending perennial, finally branching above, 8 to 12 dm. high, with broad leaves and terminal, diffuse panicles 8 to 13 cm. long. Spikelets (*a*, *b*, *d*) oblong, smooth or finely pilose, 3 mm. long. The panicles on the branches are for the most part included within the uppermost sheaths.—Low thickets, Quebec to Michigan, and southward to Georgia and Texas. May–September.



FIG. 389. *Panicum malacon* Nash, Bull. Torr. Bot. Club, 24: 197. 1897.—A rather rigid, erect perennial, finally much branched near the base, with bearded nodes, hairy sheaths and stems, firm leaves 3 to 10 cm. long, and open few-flowered panicles 7 to 10 cm. long. Spikelets (*a*, *b*) obovate, obtuse, pubescent, 3 to 3.5 mm. long. Whole plant pubescent, with white, ascending hairs.—New Jersey (?), high pine lands of southern Florida. May.



FIG. 390. *Panicum angustifolium* Ell. Bot. S. Car. & Ga. 1: 129. 1817.—A rather slender but rigid, erect, more or less pubescent perennial, 3 to 6 dm. high, at first simple, finally much branched throughout. Leaves of the primary stems erect, 8 to 15 cm. long and 4 to 6 mm. wide; those of the wiry branches shorter and much narrower. Panicles 7 to 10 cm. long, spreading, and rather loosely flowered. Spikelets (*a*, *b*, *c*) 3 mm. long, oblong, obtuse; outer glumes finely pubescent.—Dry soil, North Carolina to Florida and westward to Missouri and Texas. March–October.



FIG. 391. *Panicum wilcoxianum* Vasey, U. S. Dept. Agr. Div. Bot., Bull. 8: 32. 1889.—A rather slender, very hairy, and finally much-branched perennial 2 to 2.5 dm. high, with erect, acute leaves, and small, spreading panicles 2 to 3 cm. long. Spikelets (*a*, *b*, *c*) oblong, obtuse, 3 mm. long, with pubescent outer glumes.—Dry prairies, Kansas northward through Nebraska and South Dakota to Manitoba. June–August.



FIG. 392. *Panicum malacophyllum* Nash, Bull. Torr. Bot. Club, **24**: 198. 1897.—A hairy, erect, or ascending perennial, 2 to 4 dm. high, at length much branched above with narrow, softly pubescent leaves and open panicles 3 to 5 cm. long, the flexuous branches bearing obovate spikelets (*a*, *b*, *c*) 3 to 3.5 mm. long. Outer glumes densely pubescent, with rather long, spreading hairs.—Cedar barrens, etc., Tennessee to Arkansas and Indian Territory. May–July.



FIG. 393. *Panicum scribnerianum* Nash, Bull. Torr. Bot. Club, 22: 421. 1895. (*P. scoparium* A. Gray in part, not Lam.).—Anerect and finally branching perennial 1.5 to 6 dm. high, with usually papillate-pilose sheaths, more or less spreading, flat leaves, which are smooth and scabrous beneath, and small, ovoid panicles 2 to 3 cm. long. Spikelets (*a*, *b*, *c*) obovoid, 3 mm. long, nearly glabrous.—In dry or moist soils from Maine and Ontario westward to Wyoming, and southward to Tennessee, Texas, and Arizona. May-September.



FIG. 394. *Panicum pauciflorum* Ell. Sk. Bot. S. Car. & Ga. 1: 120.—A comparatively stout, usually erect, and finally branching perennial 3 to 5 dm. high, with hairy sheaths, narrow leaves, and small, few-flowered panicles. Leaves smooth above, roughened beneath. Spikelets (*a*, *b*, *c*) oval or oblong, 4 mm. long, the second and third glumes pubescent. Loose or more or less sandy and usually damp soils.—Georgia and South Carolina. May–October.



FIG. 395. *Panicum equilaterale* Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11: 42. Pl. 2. 1898.—A rather stout, erect, and densely caespitose, glabrous perennial 3 to 6 dm. high, with long, lanceolate leaves and open panicles 7 to 10 cm. long. Spikelets (a, b, c) elliptical or obovate, obtuse, 3 to 3.5 mm. long, with the first glume 3-nerved, the second and third nearly equal, 7- to 9-nerved, slightly pubescent.—Pine and “hummock” lands, Florida. June–August.



FIG. 396. *Panicum latifolium* Linn. Sp. Pl. Ed. 1, 58. 1753, excluding reference to Sloane. (*P. walteri* Poir.; *P. porterianum* Nash.).—A rather slender, branching perennial 3 to 6 dm. high, with broad, ovate-lanceolate leaves, and few-flowered, nearly simple panicles. Spikelets (*a*, *b*, *c*) ovate-elliptical or pear-shaped, obtuse, about 4 mm. long, outer glumes shortly pubescent.—Common in open woodlands and thickets, Maine and Ontario to Minnesota, and southward to Florida and Texas. May–October.



FIG. 397. *Panicum leibergii* Scribn. U. S. Dept. Agr. Div. Agros. Bull. 8 : 6. pl. 3. (*P. scoparium leibergii* Vasey, Contr U. S. Nat. Herb., 3 : 31.)—A slender, erect, or ascending perennial grass, 3-6 dm. high, with rather broad, flat leaves and few-flowered panicles of comparatively large, obtuse spikelets (*a*, *b*, *c*) 3 to 4 mm. long, the outer glumes papillate-pilose with stiff, spreading hairs.—Iowa, Minnesota, the Dakotas, and Missouri. May-July.



FIG. 398. *Panicum ovale* Ell. St. Bot. S. Car. & Ga. 1 : 123. 1817.—A rather stout, erect, and finally much-branched perennial with villous sheaths and leaves (later becoming smooth) and ovate panicles 5 to 6 cm. long. Spikelets (*a*, *b*, *c*) obovate or oval, 2.5–3 mm. long, the second and third glumes pubescent. Leaves of the culm erect, 6 to 12 cm. long and 4 to 7 mm. wide.—South Carolina to Florida.



FIG. 399. *Panicum xanthophysum* A. Gray, Ann. Lyc. N. Y. 3: 233. 1835.—A slender, or occasionally rather stout, erect perennial, 3 to 6 dm. high, sparingly branching near the base, with broadly lanceolate leaves 6 to 15 cm. long, and simple, rather few-flowered, racemose panicles 3 to 8 cm. long. Spikelets (*a*, *b*, *c*) obovoid, obtuse, about 3 mm. long, the second and third glumes pubescent.—Dry, sandy soil, Maine to New Jersey and westward to Minnesota and Manitoba. June–September.



FIG. 400. *Oplismenus hirtellus* (Linn.) R. & S. Syst. 2 : 481. (*Panicum hirtellum* Linn.) CREEPING BEARD-GRASS.—A weak, decumbent, and more or less extensively creeping perennial 3 to 6 dm. long, with broad, flat leaves, and simple, racemose panicles 6 to 8 cm. long. Spikelets (*a*) about 3 mm. long.—Moist woodlands and swamps, Georgia and Florida, westward to Louisiana and Texas. [Mexico and South America.] June-October.



FIG. 401. *Chaetochloa glauca* (Linn.) Scribn. U. S. Dept. Agr. Div. Agrös., Bull. 4: 39. 1897. (*Panicum glaucum* Linn.; *Setaria glauca* Beauv.) YELLOW FOXTAIL.—An erect, leafy annual 3 to 6 dm. high, usually much branched near the base, with flat leaves and bristly, spike-like panicles 2 to 8 cm. long. Bristles 5 to 10 to each spikelet, usually yellow. Spikelets about 3 mm. long, with the second glume about half the length of the transversely rugose flowering-glume.—Fields and waste places about dwellings, etc., throughout. Naturalized from Europe. June-September.



FIG. 402. *Chaetochloa magna* (Griseb.) Scribn. U. S. Dept. Agr. Div. Agros., Bull. 4:39. 1897. (*Setaria magna* Griseb.) GIANT MILLET.—A stout, erect, leafy annual (?) 18 to 36 dm. high, much branched below, with broad, flat leaves and bristly, densely flowered panicles 15 to 35 cm. long. Spikelets (b) 2 mm. long, with the second glume as long as the smooth fruiting glume.—Low grounds along the coast from southern Maryland and Virginia southward to Florida and westward to Texas. [West Indies and Bermudas.] July–October.



FIG. 403. *Chaetochloa verticillata* (Linn.) Scribn. U. S. Dept. Agr., Div. Agros., Bull. 4 : 39. 1897. (*Panicum verticillatum* Linn.; *Setaria verticillata* Beauv.) BRISTLY FOXTAIL.—A leafy, upright annual 3 to 6 dm. high, much branched near the base, with rather slender, spike-like panicles 2 to 6 cm. long. Bristles as long as or a little exceeding the spikelets, downwardly barbed.—Fields and waste places, New England to Virginia and Kentucky, westward to South Dakota and Nebraska. Naturalized from Europe. June–September.



FIG. 404. *Cenchrus gracillimus* Nash, Bull. Torr. Bot. Club, **22**: 300. 1895. **SLENDER SAND-BUR.**—An ascending, sparingly branched, slender, leafy annual 3 to 6 dm. high, with loosely flowered, slender spikes 3 to 5 cm. long. Involucre (*b*) ovate, smooth, with numerous long, slender, usually purplish spines.—High pine lands, Florida. April-September.



FIG. 405. *Cenchrus incertus* M. A. Curt. Bost. Journ. Nat. Hist. **1** : 135. 1837. (*C. strictus* Chapm. Coult. Bot. Gaz. **3** : 20. 1878.) SOUTHERN SAND-BUR.—A smooth, ascending, and more or less branched perennial (?), 4.5 to 9 dm. high, with flat leaves and slender spikes 5 to 8 cm. long. Spikelets inclosed in a bur-like involucre (*a*) which is naked below, with 6 to 12 stout spines above.—Sandy soil along the coast, Georgia to Florida and westward to Texas. June–October.



FIG. 406. *Cenchrus macrocephalus* Scribn. new name. (*C. tribuloides macrocephalus* Doell, Flor. Bras., 2 : part 2, 312. 1877. ex char.) LARGE SAND-BUR.—A coarse, much branched and leafy annual, with prostrate or ascending culms 3 to 6 dm. long, and dense spikes 2 to 8 cm. long. Involucres or "burs" (a) pubescent, about 8 mm. long and 6 mm. broad, with numerous stout spines.—Sands along the coast, New Jersey and southward (?), New Orleans.

Burs about twice the size of those of *Cenchrus tribuloides*.



FIG. 407. *Cenchrus echinatus* Linn. Sp. Pl. 1488. COCK SPUR.—A stout, erect or ascending perennial 3 to 10 dm. high, with rather broad, flat leaves and cylindrical, dense spikes 8 to 12 cm. long. Involucres (*a*) pilose or downy, with many spines above and bristly near the base.—Dry soil, fields and waste places, South Carolina to Florida and westward to Texas. [Mexico and southward.] March-September.



FIG. 408. *Zizaniopsis miliacea* (Michx.) Doell & Aschers.
(Zizania miliacea Michx. Flor. Bor. Am. 1 : 74. 1803.) WATER
 MILLET.—A stout, erect, glabrous, semiaquatic grass 12 to 45 dm.
 high, from long, creeping rootstocks, with long, broad leaves and
 dense panicles 30 to 45 cm. long. Spikelets staminate (c) and
 pistillate (a, b), the former 6 to 8 mm. long, awnless, the latter
 about 6 mm. long, the outer glume with an awn 2 to 6 mm. long.—
 Swamps, etc., Florida to Texas and (according to Riddell) north-
 ward to Ohio. May–August.



FIG. 409. *Zizania aquatica* Linn. Sp. Pl. 991. WILD RICE
 "REEDS."—A stout, erect, aquatic annual 9 to 30 dm. high, with
 broad, flat leaves and large panicles 30 to 60 cm. long. Stami-
 nate spikelets (c) 6 to 12 mm. long, awnless; the pistillate
 spikelets (a) 8 to 24 mm. long, the outer one bearing an awn 24 to
 48 mm. long. Grain linear, 10 to 16 mm. long.—Swamps and
 shallow margins of sluggish streams and rivers, New Brunswick
 to Manitoba, southward to Florida and Texas. June–October.



FIG. 410. *Savastana alpina* (Sw.) Scribn. Mem. Torr. Bot. Club, 5:34. 1894. (*Holcus alpinus* Sw. *Hierochloa alpina* R. & S.) ALPINE HOLYGRASS.—A slender, glabrous, erect perennial 1.5 to 4.5 dm. high, with flat leaves and contracted panicles 1.5 to 3 cm. long. Spikelets 5 to 7 mm. long, with the awn of the fourth glume more or less bent and about 6 mm. long.—Greenland to Alaska and on the high mountains of New England and New York. [Northern Europe and Asia.] July, August.



FIG. 411. *Phalaris arundinacea* Linn. Sp. Pl. 55. REED CANARY-GRASS.—A stout, erect, glabrous, broad-leaved perennial, 6 to 15 dm. high, with densely flowered panicles, 6 to 16 cm. long. Spikelets (*a*) 5 to 6 mm. long, with scabrous, 3-nerved outer glumes (*b*), one-fourth longer than the obtuse, pubescent flowering glume.—Moist places and in shallow water, Nova Scotia to British Columbia, and southward to Maryland, Tennessee, Kansas, Arizona, and California. [Europe, Asia.] June–September.



FIG. 412. *Phalaris lemmoni*, Vasey, Contrib. Nat. Herb. 3 : 42. 1892. LEMMON'S CANARY-GRASS.—A rather slender, erect perennial 4 to 10 dm. high, with short, flat leaves and spike-like, cylindrical panicles 4 to 6 cm. long. Spikelets 4 to 5 mm. long, with acute, wingless outer glumes (*a*) and lanceolate, acuminate, pubescent flowering glume (*b*) nearly as long as the outer ones.—California. June.



FIG. 413. *Aristida californica* Thurb. in Brewer & S. Wats. Bot. Calif. 2: 239. 1880.—HARE'S GRASS.—A slender, densely tufted, pubescent perennial, with very narrow involute leaves and racemose, few-flowered panicles 2 to 4 cm. long. Outer glumes unequal; flowering glume shorter than the first glume. Awns slender, nearly equal, 3 to 4 cm. long, twisted below into a slender stipe, which is articulated with the flowering glume.—Dry, desert places, Arizona to southern and Lower California. May.



FIG. 414. *Aristida dichotoma* Michx. Flor. Bor. Am. 1 : 41. 1803. POVERTY GRASS.—A slender, erect, dichotomously branching annual 1.5 to 6 dm. high, with narrow, usually involute leaves and slender, spike-like racemes or simple panicles 4 to 10 cm. long. Spikelets about 6 mm. long, with nearly equal outer glumes and narrow, three-awned flowering glumes; lateral awns 2 mm. long or less, the middle awn coiled at the base, 5 to 8 mm. long.—Dry, sandy soil from Canada southward to Florida and westward to Ontario, Missouri, and Texas. August, September.



FIG. 415. *Aristida basiramea* Engelm.; Vasey, in Coulter Bot. Gaz. 9 : 76. 1884. TUFTED TRIPLE-AWN.—An erect, slender, smooth, much-branched perennial 1 to 4 dm. high, with narrow, involute-setaceous leaves, and few-flowered, spike-like panicles 6 to 10 dm. long. Empty glumes (*a*) unequal; middle awn 12 to 18 mm. long, coiled at the base and divergent.—Dry soil, Illinois and Manitoba, to Virginia and Kansas. August, September.



FIG. 416. *Aristida desmantha* Trin. & Rupr., Mém. Acad. St. Petersb. (VI), 5: 199. 1842. WESTERN BUNCH-GRASS.—Slender, but rather rigid, erect, glabrous perennial 3 to 6 dm. high, with narrow, attenuate-pointed leaves and narrow panicles about 12 cm. long. Spikelets with the nearly equal outer glumes (*b*) about 12 mm. long, exceeding the flowering glume (*a*), which bears 3 nearly equal, reflexed, somewhat coiled awns about 24 mm. long.—Dry soil, Kansas (?), Indian Territory, and Texas. August.



FIG. 417. *Aristida spiciformis* Ell. Bot. S. Car. & Ga. 1:141. 1817. SPIKE-LIKE POVERTY GRASS.—A stout, erect perennial, 3 to 9 dm. high, with rather long, linear leaves and densely flowered, cylindrical, spike-like panicles. Outer glumes much shorter than the flowering one, which is twisted above to the spreading or divergent awns. The middle awn longer than the lateral ones.—Moist pine barrens, Georgia and Florida to Mississippi. July–October.



FIG. 418. *Aristida oligantha* Mx. Flor. Bor. Am. 1 : 41. 1803.
 PRAIRIE TRIPLE-AWN.—A tufted, much-branched native annual,
 with slender stems 2 to 4 dm. high, loose sheaths, narrow leaves
 and lax, few-flowered panicles.—In poor, dry soil from the Middle
 States southward to Louisiana and Texas and also in Oregon and
 California. July-October.



FIG. 419. *Aristida fasciculata* Torr. Ann. Lyc. N. Y. 2 : 154. 1826. DOG-TOWN GRASS.—A slender or sometimes rather stout, densely caespitose, wiry perennial 2 to 4 dm. high, with narrow, rather rigid, involute leaves, and contracted, few-flowered panicles 5 to 12 cm. long. Spikelets usually purplish, with very unequal empty glumes, the first about one-half the length of the second, which is 14 to 24 mm. long; the flowering glume usually about 12 mm. long, terminated by three divergent, nearly equal awns varying in length from 2 to 10 cm.—Dry soil, Minnesota to Kansas and Texas, and westward to British Columbia and Arizona. April–September.



FIG. 420. *Aristida havardii* Vasey, Bull. Torr. Bot. Club, 13: 27. 1886. HAVARD'S POVERTY GRASS.—A slender, erect, branching perennial, usually about 3 dm. high, with setaceous leaves and divaricate-spreading, flexuous panicles 8 to 12 cm. long. Empty glumes (*a*), slightly unequal. Awns spreading, nearly equal, 12 to 14 mm. long.—Western Texas to New Mexico and Arizona. August-October.



FIG. 421. *Aristida divergens* Vasey, Contrib. Nat. Herb., 3: 48. 1892. TEXAS POVERTY-GRASS.—A rather rigid, erect perennial, 3 to 6 dm. high, with narrow, involute leaves and diffuse panicles 10 to 16 cm. long. Second glume a little longer than the first (a), bristle-pointed, and slightly exceeding the flowering glume (b), which is 6 to 8 mm. long. Awn 10 to 12 mm. long, the lateral awns wanting or nearly so.—Arizona and Texas. August, September.



FIG. 422. *Aristida floridana* (Chapm.) Vasey. 1892. (*Streptachne floridana* Chapm. Fl. S. St. 554.) FLORIDA CURLY BEARD.—A slender, erect, somewhat wiry perennial, about 6 dm. high, with nearly filiform leaves and narrow panicles 30 cm. long. Spikelets (a) with nearly equal, purplish empty glumes and a strongly involute, linear flowering glume tapering into a long, more or less curved or flexuous awn; lateral awns wanting.—Florida. September.



FIG. 423. *Stipa avenacea* Linn. Sp. Pl. 78. (*S. barbata* Michx.)
 BLACK OAT-GRASS.—A smooth, erect perennial 3 to 7.5 pm. high, with involute, filiform leaves and open, few-flowered panicles 10 to 16 cm. long. Spikelets 8 to 10 mm. long. Awn 3 to 5 cm. long.—Dry open woodlands, etc., Rhode Island to Ontario and Wisconsin and southward to Florida and Mississippi. April-July.



FIG. 424. *Stipa avenaceoides* Nash, Bull. Torr. Bot. Club, 22 : 423. 1895. FEATHER GRASS.—A rather slender, erect, smooth perennial, 6 to 12 dm. high, with long involute-setaceous leaves and simple panicles 8 to 20 cm. long. Spikelets few, with acuminate empty glumes (*a*), 16 to 20 mm. in length; flowering glumes (*b*), including the callus, 14 to 16 mm. long. Awn 6 to 8 cm. long, pubescent below, twice geniculate.—Florida in pine lands, near Cassia, Lake County. March-July.



FIG. 425. *Stipa comata* Trin. & Rupr. Agrost. 3:75. 1842. NEEDLE GRASS. — A rather stout, erect, caespitose perennial 3 to 9 dm. high, with mostly involute leaves and loosely-flowered panicles 16 to 24 cm. long. Spikelets with nearly equal long-attenuate-pointed empty glumes (*a*) about 24 mm. long, and thinly pubescent flowering glumes (*b*) about 12 mm. long. Awu slender, 8 to 10 cm. long, strongly flexuous or variously curled and twisted.—Dry sandy soil, British Columbia to California and eastward to the Dakotas and Nebraska. May-September.



FIG. 426. *Stipa oregonensis* Scribn. new name. (*S. stricta* Vasey, not Lam.) NARROW-TOPPED FEATHER-GRASS.—A slender, erect, tufted perennial 3 to 5 dm. high, with narrow, setaceous pointed leaves and contracted, erect panicles 8 to 16 cm. long. Empty glumes (*a*) 10 mm. long, exceeding the thinly pubescent flowering glumes. Awn 24 to 36 mm. long, pubescent or subplumose in the lower half.—Oregon and Washington.



FIG. 427. *Stipa hassei* Vasey, Contrib. Nat. Herb. 1: 267. 1893.
 HASSE'S FEATHER-GRASS.—A slender, wiry, and densely tufted perennial, 3 to 4.5 dm. high, with narrow, almost thread-like, erect leaves and narrow panicles 4 to 6 cm. long. Spikelets about 6 mm. long, with narrowly lanceolate, nearly equal, acute empty glumes (*a*) which slightly exceed the smooth flowering glume. Awn 16 to 18 mm. long, smooth.—Dry soil, ridges, etc., southern California. April.



FIG. 428. *Stipa neo-mexicana* (Thurber). new comb. (*S. pennata neo-mexicana* Thurber in Vasey, Ill. N. Amer. Grasses (2^d: No. 8, 1891.) NEW MEXICAN FEATHER-GRASS.—A rather stout, erect, densely tufted perennial 3 to 9 dm. high, with involute leaves and narrow, racemose panicles 8 to 10 cm. long. Awns 8 to 12 cm. long, feather-plumose excepting near the base.—High northern slopes of the mountains of southern Colorado, New Mexico, Arizona, and Texas. May–September. Ornamental.



FIG. 429. *Stipa pringlei* Scribn. Contrib. Nat. Herb. 3: 54. 1892. (*Oryzopsis pringlei* Beal.) PRINGLE'S FEATHER-GRASS.—A slender, erect, caespitose perennial 6 to 12 dm. high, with long, flat leaves and loosely few-flowered panicles 15 to 20 cm. long. Spikelets 8 to 10 mm. long, with acute, 5-nerved empty glumes (*a*), and pubescent flowering glumes (*b*). Awn slender, about 20 mm. long.—Dry slopes, Texas, to Arizona and California. [Mexico.] July–October.



FIG. 430. *Stipa viridula* Trin. Mem. Acad. St. Petersburg. (VI.) 2: 39. 1836. FEATHER BUNCH-GRASS.—A slender or rather stout, caespitose, erect perennial 5 to 10 dm. high, with involute-pointed leaves and narrow, contracted panicles 12 to 20 cm. long. Spikelets with nearly equal, subulate-pointed empty glumes 6 to 9 mm. long, and hairy or pilose flowering glume, which is about 5 mm. long and has a short, obtuse callus. Awn about 24 mm. long, finally separating from the glume.—Colorado to Montana and westward.



FIG. 431. *Stipa macounii* Scribn. Macoun Cat. Can. Pl. 5: 390. 1890. (*S. richardsonii* A. Gray, 1856, not Link, 1833.) MACOUN'S STIPA.—A slender, densely caespitose perennial 3 to 6 dm. high, with very narrow leaves and few-flowered panicles 4 to 10 cm. long. Empty glumes (*a*) about 4 mm. long, the pubescent flowering glumes a little shorter than the empty ones. Awn, 8 to 10 mm. long.—Maine to Lake Superior and northward. July-August.



FIG. 432. *Stipa tenuissima* Trin. Mem. Acad. St. Petersb. (VI.) 2:36. 1836. SLENDER FEATHER-GRASS.—A slender, densely-tufted perennial 5 to 8 dm. high, with long, filiform leaves and narrow panicles 15 to 20 cm. long. Empty glumes (*a*), subulate-pointed, the first 12 to 18 mm., the second 5 to 8 mm. long; flowering glume (*b*) about 2.5 mm. long. Awn flexuous, 7 to 8 cm. long.—Limestone hills, etc., Texas and New Mexico. [Mexico.] August, September.



FIG. 433. *Stipa bloomeri* Boland. Proc. Calif. Acad. Sci. 4: 168. 1870. (*S. sibirica* Thurb., not Lam.) BLOOMER'S STIPA.—A slender, densely caespitose perennial 3 to 9 dm. high, with long, narrow or involute leaves and more or less open panicles 12 to 24 cm. long. Spikelets 8 mm. long, empty glumes (a) acute, one-fourth longer than the hairy flowering glume (b). Awn 12 to 18 mm. long.—California and Montana.



FIG. 434. *Stipa coronata* Thurber, in Brewer & S. Wats. Bot. Calif. 2 : 287. 1880. CRESTED FEATHER-GRASS.—A stout, erect perennial 12 to 18 dm. high, with flat leaves, the lower ones often 9 dm. long, and erect, narrow, and rather densely flowered panicles 3 to 4 dm. long. Spikelets with unequal, acuminate-pointed empty glumes (*a*), the lower one about 16 mm. long, and silky-hairy flowering glumes (*b*), which have a crown of longer (4 mm.) hairs. Awn slender, about 2 cm. long.—Sandy plains and hillsides, Arizona and California. March–September.



FIG. 435. *Stipa richardsoni* Link, Hort. Berol. 2 : 245. 1833. RICHARDSON'S FEATHER-GRASS.—A slender, erect perennial 6 to 9 dm. high, with narrow leaves, and nodding, open, few-flowered panicles 7 to 12 cm. long. Spikelets (a) 8 to 9 mm. long, the broadly lanceolate, acute empty glumes exceeding the thinly hairy flowering glume (b). Awn slender, scabrous, 12 to 20 mm. long.—Dry hillsides and open woods, South Dakota, Colorado, Wyoming, Montana, and Canada. July–September.



FIG. 436. *Stipa occidentalis* Thurb. Bot. Wilkes Exped. 483. 1874. WESTERN NEEDLE-GRASS.—A slender, erect perennial 3 to 6 dm. high, with rigid, involute leaves and contracted panicles 6 to 12 cm. long. Spikelets about 10 mm. long, flowering glumes (*b*) pubescent, 6 to 7 mm. long. Awn 3 cm. long, plumose below.—Dry soil and rocky banks of the plains and foot-hills, Nevada, California, Oregon, and Washington. May-July.



FIG. 437. *Stipa vaseyi* Scribn. U. S. Dept. Agr. Div. Agros. Bull. 11: 46. 1898. (*Stipa viridula* var. *robusta* Vasey; not *Stipa robusta* Nutt.) SLEEPY GRASS.—A stout, erect perennial 12 to 18 dm. high, with long, flat leaves and erect, densely flowered panicles 30 to 45 cm. long. Spikelets about 10 mm. long, with pubescent flowering glumes (*b*) 6 to 7 mm. long. Awn slender, about 26 mm. long.—Colorado, New Mexico, southern California. [Mexico.] June–September.



FIG. 438. *Stipa scribneri* Vasey, Bull. Torr. Bot. Club, 11 : 125. 1884. SCRIBNER'S FEATHER-GRASS.—A stout, erect, smooth perennial 4.5 to 7.5 dm. high, with rather long, narrow, involute-pointed leaves and contracted panicles 12 to 16 cm. long. Spikelets 12 to 14 mm. long, with pubescent flowering glumes (*b*) which are 6 to 10 mm. long and crowned with a tuft of rather long hairs.—Dry soil of mesas and canyons, Colorado and New Mexico. June–September.



FIG. 439. *Stipa parishii* Vasey, Coult. Bot. Gaz. 7: 32. 1882. PARISH'S FEATHER-GRASS.—A rather stout, erect, tufted perennial 3 to 4.5 dm. high, with rigid, involute leaves and open, erect panicles about 15 cm. long. Spikelets 12 to 14 mm. long, with flowering glumes (*b*) densely covered with long, silky hairs. Awn about 18 mm. long.—Dry soil, mountains of southern and Lower California. June–August.



FIG. 440. *Stipa speciosa* Trin. & Rupr. Sp. Gram. Stip. 45. 1842. SHOWY FEATHER-GRASS.—A rather stout, erect, caespitose perennial 3 to 6 dm. high, with long, narrow, radical leaves and erect, contracted panicles 12 to 16 cm. long. Spikelets 16 to 18 mm. long, with silky-pubescent flowering glumes (*b*) 10 to 12 mm. long. Awn 3 to 4 cm. long, plumose below the middle.—Dry soil, Colorado and Arizona to southern and Lower California. [South America.] April–September.



FIG. 441. *Oryzopsis webberi* (Thurb.) Vasey, Bull. Torr. Bot. Club, **15** : 49. 1888. (*Eriocoma webberi* Thurb. in Brewer & S. Wats. Bot. Calif. **2** : 283. 1880).—A slender, wiry, and densely tufted perennial 1 to 2 dm. high, with rigid, pungent-pointed, convolute leaves, and narrow, few-flowered panicles, 2 to 5 cm. long. Spikelets about 8 mm. long with acuminate empty glumes, and awned flowering glumes which are densely clothed with white, silky hairs. Awn very slender, about 4 mm. long.—California.



FIG. 442. *Oryzopsis juncea* (Mx.) B. S. P. Prel. Cat. N. Y. 67. 1888. (*Stipa juncea* Mx.; *Oryzopsis canadensis* Torr.) SMALL MOUNTAIN RICE.—An erect, glabrous, slender, tufted perennial 1.5 to 6 dm. high, with erect, involute leaves and narrow panicles 2 to 5 cm. long. Spikelets 3 to 4 mm. long, with pubescent flowering glumes which bear a slender, deciduous awn 1 to 2 mm. long.—Dry, rocky soil and open woodlands, Maine to British Columbia southward to Pennsylvania and Colorado. May–August.



FIG. 443. *Muhlenbergia trichopodes* (Ell.) Chapm. Fl. S. U. S. 553. 1860. (*Agrostis trichopodes* Ell.) BUNCH HAIR-GRASS.—A slender, rather rigid perennial, 6 to 9 dm. high, with very narrow, involute leaves and capillary panicles nearly 30 cm. long. Spikelets (a) with nearly equal empty glumes which are hardly more than half the length of flowering glume (c), which is terminated by a short, straight awn.—Dry pine barrens, North Carolina to Florida and westward to Texas. July–October.



FIG. 444. *Muhlenbergia comata* (Thurb.) Benth.; Joar. Linn. Soc. **19** : 83. 1881. (*Vaseya comata* Thurb. Proc. Acad. Nat. Sci. Phila, 1863. 79. WOOLLY DROP-SEED.—A rather stout or slender, upright perennial, 3 to 9 dm. high, with flat leaves and densely flowered, more or less lobed, or interrupted panicles, 6 to 8 cm. long. Spikelets about 3 mm. long, with densely silky-hairy flowering glumes (*b*).—Rather moist, broken ground, in mountains and foothills, Nebraska to Oregon, south to Colorado and California. July-September.



FIG. 445. *Muhlenbergia dumosa* Scribn. in Vasey, Contrib. Nat. Herb. 3:71. 1892. (*Sporobolus depauperatus* (?) Scribn. in Bull. Torr. Bot. Club. 9: 103. 1882.) SHRUBBY DROP-SEED.—A stout, woody, much-branched and leafy perennial, with erect or ascending culms 6 to 9 or 12 dm. long, and slender, simple panicles 1 to 3 cm. long. Spikelets about 3 mm. long with short-awned flowering glumes.—Rocky canyons and along streams in the mountains of Arizona. [Mexico]. May, June.



FIG. 446. *Muhlenbergia monticola* Buckley, Proc. Acad. Nat. Sci. Phila. 1862, 91.—A slender, wiry, much-branched perennial 3 to 6 dm. high, with short, narrow leaves and strict (or in anthesis spreading) panicles 8 to 20 cm. long. Spikelets with unequal empty glumes, the longer second one 2 mm. long and usually obtuse or toothed at the apex; the narrow flowering glume is 3 mm. long, pilose near the base and tipped with a very slender flexuose awn 10 to 15 mm. long.—Dry soil, Texas to Arizona. [Mexico]. August–October.



FIG. 447. *Muhlenbergia lemmoni* Scribn. Contrib. Nat. Herb. 13:70. 1892. LEMMON'S DROP-SEED.—A leafy, ascending, wiry perennial 3 to 6 dm. high, much branched at the base, with narrow, densely flowered, interrupted panicles 6 to 8 cm. long. Spikelets about 4 mm. long, with lanceolate-acuminate empty glumes (*a*), and broadly lanceolate, short-awned flowering glumes which are densely pubescent below.—Mountains, Texas to Arizona. September.



FIG. 448. *Muhlenbergia capillaris* Trin. Unifl. 191. 1824. (*Stipa capillaris* Lam. 1791.) BEARDED HAIR-GRASS.—A rigid, erect, glabrous, and unbranched perennial 6 to 10 dm. high, with long, involute leaves and showy, capillary panicles 15 to 45 cm. long. Spikelets about 4 mm. long, with nearly equal empty glumes and smooth flowering glume which bears a slender awn 6 to 18 mm. long.—Dry, sandy, or rocky soil, open woods, etc., Massachusetts to Florida and westward to Texas. August-October.



FIG. 449. *Muhlenbergia parviglumis* Vasey, Contrib. Nat. Herb. 3: 71. 1892. SMALL-GLUMED DROP-SEED.—A slender, erect perennial 3 to 6 dm. high, often branching, with rather rigid, narrow leaves and narrow panicles 8 to 14 cm. long. Spikelets about 3 mm. long, with minute, nearly equal and obtuse empty glumes (*a*), one-fourth to one-fifth as long as the narrow, sharply two-toothed flowering glume, which bears a slender awn between the teeth 12 to 20 mm. long.—Texas. September, October.



FIG. 450. *Lycurus phleoides* HBK. Nov. Gen. 1: 142, t. 45. 1815. TEXAN TIMOTHY.—A slender and somewhat wiry perennial 2 to 4.5 dm. high, much branched and often geniculate at the base, with narrow, long-pointed leaves and cylindrical, spike-like panicles 3 to 6 cm. long. Spikelets 4 mm. long, with awned glumes, the first glume (*C*) often terminating in two unequal awns, the flowering glume terminating in an awn as long as itself.—Dry soil on the plains and mesas, Colorado to Texas and westward to New Mexico and Arizona. [Mexico.] May–October.



FIG. 451. *Phleum alpinum* Linn. Sp. Pl. 59. ALPINE TIMOTHY.—A glabrous, erect perennial, 1.5 to 4.5 dm. high, with flat leaves and cylindrical, ovoid, or oblong, spike-like panicles 1 to 5 cm. long. Empty glumes (*a*) short-awned 3 to 4 mm. long.—Moist soil in the mountains, Labrador to Alaska, south to New England, Arizona, and California. [Europe, Asia, South America.] June-September.



FIG. 452. *Alopecurus alpinus* J. E. Smith, Engl. Bot. pl. 1126. 1803. ALPINE FOXTAIL.—A glabrous, erect perennial 1 to 6 dm. high, with flat leaves and cylindrical, ovoid, densely-flowered panicles 1 to 3 cm. long. Spikelets 4 mm. long, with obtuse, densely villous outer glumes (*a*) about the length of flowering glume, which is pubescent near the apex, glabrous below, and bears upon the back, just below the middle, a slender awn a little exceeding the glumes.—Moist places, Greenland, Labrador to Alaska. [Arctic regions of Europe and Asia.] July, August.



FIG. 453. *Coleanthus subtilis* Seid. litt. R. & S. Syst. 2: 276. 1817. (*Schmidtia utriculosa* Sternb. 1819; *S. subtilis* Tratt.) MOSS-GRASS.—A low, moss-like grass growing in loose tufts 2 to 6 cm. high, with short, recurved leaves, inflated sheaths, and simple panicles 1 to 2 cm. long. Spikelets (*a, b*) hardly 1 mm. long, in small, umbellate clusters.—Wet, muddy places, Washington and Oregon. [Northern Europe.] September, October.



FIG. 454. *Sporobolus serotinus* (Torr.) A. Gray, Man. 577. 1848. (*Agrostis serotina* Torr. 1824.) LATE DROP-SEED.—A slender, erect perennial 1.5 to 4.5 dm. high, with very narrow, flat leaves and delicate, open panicles 6 to 18 cm. long. Spikelets about 1.5 mm. long, with the outer glumes (*a*), about one-half the length of the flowering glume.—Bogs and wet, sandy soil, Maine to New Jersey and westward to Michigan. August, September.



FIG. 455. *Sporobolus junceus* (Michx.) Kunth, Revis. Gram. 1: 68. 1835. (*Agrostis junceus* Michx. Flor. Bor. Am. 1: 52. 1803.) RUSH GRASS.—A glabrous, erect, slender, wiry perennial with setaceous leaves, the basal ones 12 to 24 cm. long, and open panicles 6 to 14 cm. in length. Spikelets (*a*) 2.5 to 3 mm. long, with very unequal empty glumes, the first one-fourth to one-third as long as the second, which equals the subacute flowering glume.—Dry, sandy soil, Virginia to Florida and westward to Texas. February–December.



FIG. 456. *Sporobolus cryptandrus* (Torr.) A. Gray, Man. 576. 1848. (*Agrostis cryptandra* Torr.) SAND RUSH-GRASS.—An erect, glabrous, caespitose perennial, 4 to 7 dm. high, with flat leaves 6 to 12 cm. long, and open panicles 12 to 20 cm. long. Spikelets 2 to 3 mm. long.—Sandy soil, Massachusetts and Pennsylvania, westward to Montana and Washington, southward to Texas and New Mexico. [Mexico.] June–September.



FIG. 457. *Sporobolus domingensis* (Trin.) Kunth, Enum. Pl. 1: 214. 1833. (*Vilfa domingensis* Trin.; *Agrostis domingensis* Schultes.) WEST INDIAN RUSH-GRASS.—An erect, glabrous, branching perennial, usually about 3 dm. high, with rather rigid, flat, attenuate-pointed leaves and narrow, many-flowered panicles 5 to 6 cm. long. Spikelets nearly 2 mm. long.—Saline soil, near the coast, Florida. [West Indies.] June–September.



FIG. 458. *Sporobolus wrightii* Scribn. Bull. Torr. Bot. Club, 9: 103. 1882. SACCATON.—A stout, erect perennial, 10 to 18 dm. high, with long leaves and many-flowered, open panicles 30 to 60 cm. long. Spikelets (*a*) 2 mm. long, with thin, unequal, empty glumes, the second nearly as long as the flowering glume, which is of similar texture to the empty ones.—“Adobe” soil, Texas, New Mexico, and Arizona. July–September.



FIG. 459. *Sporobolus buckleyi* Vasey, Ill. N. Am. Grasses 1²: No. 17. 1891. BUCKLEY'S RUSH-GRASS.—A rather stout, erect perennial 6 to 9 d m. high, with long, flat leaves and erect, open panicles 20 to 35 cm. long. Spikelets (*a*) about 1.5 mm. long, with acute, unequal empty glumes, the second being nearly as long as the smooth, hyaline flowering glume.—Texas. [Mexico.] July.



FIG. 460. *Sporobolus jonesii* Vasey, Coulter. Bot. Gaz. 6 : 297. 1881. JONES' RUSH-GRASS.—A slender, wiry, densely tufted, erect perennial, 3 to 4.5 dm. high, with numerous short, rigid, involute radical leaves, and more or less spreading panicles 3 to 6 dm. long. Spikelets about 3 mm. long, with nearly truncate, or erose-dentate empty glumes (*a*, *c*, *d*) which are one-third to one-half as long as the acute flowering glume.—Soda Springs, near Summit, California. July.



FIG. 461. *Sporobolus ligulatus* Vasey & Dewey, Contrib. U. S. Nat. Herb. 2: 518. 1894.—A slender, smooth, upright perennial, 3 to 4.5 dm. high, with narrow, flat leaves, and contracted panicles 8 to 12 cm. long. Spikelets (*a*) 3 to 4 mm. long, subterete, with obtuse, nearly equal, empty glumes (*b*) which are about one-half as long as the smooth flowering glume.—Canyons, western Texas. September.



FIG. 462. *Sporobolus nealleyi* Vasey, Bull. Torr. Bot. Club, 15: 49. 1888. NEALLEY'S RUSH-GRASS.—A pale green, slender, densely tufted, erect, perennial 1.5 to 5 dm. high, with more or less villous sheaths, rigid, flat, spreading leaves 4 to 10 cm. long, and open panicles 3 to 8 cm. long. Spikelets (*a*, *b*) about 2 mm. long, with narrow, unequal, empty glumes.—Western Texas and New Mexico. July.



FIG. 463. *Sporobolus texanus* Vasey, Contrib. Nat. Herb. 1: 57. 1890. TEXAN DROP-SEED.—A rather slender, rigid perennial about 3 dm. high, with stiff, flat leaves 4 to 6 cm. long, and open, capillary panicles 10 to 16 cm. long. Spikelets (*a*) about 2 mm. long on capillary pedicels, with unequal empty glumes, the first about one-half as long as the spikelet.—Salt marshes, etc., Kansas to Texas. July, August. Closely allied to *Sporobolus asperifolius*.



FIG. 464. *Sporobolus asperifolius* (Nees & Mey.) Thurb. in Brewer & S. Wats. Bot. Calif. 2:269. 1880. (*Gilfa asperifolia* Nees & Meyer). ROUGH-LEAFED SALT-GRASS.—A slender, much-branched, leafy perennial 1 to 3.5 dm. high, with diffuse panicles 6 to 10 cm. long. Spikelets 1 to 5 mm. long with nearly equal, acute empty glumes (a).—Alkaline soil, Assiniboia to the Dakotas and Missouri westward to British Columbia and California. June-September.



FIG. 465. *Sporobolus thurberi* Scribn. U. S. Dept. Agr. Div. Agros. Bull 11: 48. fig. 5. 1898. THURBER'S RUSH-GRASS.—A slender, very much branched and leafy perennial 1.5 to 2.5 dm. high, from creeping rootstocks, with contracted, linear, long-exserted panicles 3 to 5 cm. long. Spikelets straw-colored, 4 to 5 mm. long. Flowering glume (*b*, *c*), are pilose for half their length.—New Mexico(?)



FIG. 466. *Sporobolus vaginæflorus* (Torr.) Wood, Classbook of Bot. 775. 1861. (*Vilfa vaginæflora*, Torr. 1834.) SOUTHERN POVERTY-GRASS.—A slender, caespitose annual, 1.5 to 4 dm. high, with very narrow, short leaves and simple, few-flowered, terminal and axillary, spike-like panicles which are about 2 cm. long and mostly inclosed in the somewhat inflated leaf-sheaths. Spikelets 2 to 4 mm. long.—Dry fields and waste places, Vermont to South Dakota and Wyoming, southward to Georgia and Texas. August, September.



FIG. 467. *Sporobolus utilis* Torr. Pac. R. Ry. Rept. 5:365. 1853. APAREJO GRASS —A slender, wiry, much branched perennial, with short, spreading, or recurved, involute leaves and narrow, simple, few-flowered panicles. Spikelets about 2.5 mm. long, with the empty glumes (*a*), about one-half the length of the obtuse flowering glume.—Swampy places, along mountain streams, western Texas to Nevada and southern California. [Mexico.] January–December.



FIG. 468. *Sporobolus simplex* Scribn. U. S. Dept. Agr. Div. Agros. Bull. 11:48, fig. 6. July, 1898. MOUNTAIN DROP-SEED.—A low, densely caespitose, leafy annual 0.5 to 1.5 dm. high, with smooth culms, short, flat leaves, and linear panicles 2 to 4 cm. long. Spikelets 2 to 2.3 mm. long, with broadly obtuse or truncate empty glumes (*a*), which are hardly one-half as long as the mucronate-pointed flowering glumes.—Moist places in the mountains of Colorado and Idaho. July–September.



FIG. 469. *Sporobolus filiformis* (Thurb.) Scribn. New Comb. (*Vilfa depauperata filiformis* Thurb. in S. Wats. Bot. King Exped 376. 1871.) SLENDER RUSH-GRASS.—A very slender, densely tufted annual 0.8 to 3 (usually about 1.5) dm. high, with short, narrow leaves, scape-like culms, and linear, few-flowered panicles. Spikelets about 2 mm. long.—Moist soil in the mountains, Washington to California and eastward to Utah and (?) Colorado. July–September.



FIG. 470. *Sporobolus virginicus* Kunth, Revis. Gram. 1: 67. 1835. (*Agrostis virginica* Linn.) SEASIDE RUSH-GRASS.—A decumbent, or erect and more or less branching, leafy perennial 1.5 to 6 dm. high, with long, creeping rootstocks and densely flowered, spike-like panicles 3 to 6 cm. long. Spikelets 2 to 3 mm. long.—Sandy shores Virginia to Florida, westward to Texas. [Mexico and West Indies.] August–September.



FIG. 471. *Blepharoneuron tricholepis* (Torr.) Nash, Bull. Torr. Bot. Club, **25**: 88. (?) (*Vilfa tricholepis* Torr. Pacif. R. Ry. Rept. **4**: 155. 1857).—A slender, erect, densely caespitose perennial 2.5 to 6 dm. high, with narrow, glabrous leaves and more or less spreading panicles 6 to 18 cm. long. Spikelets 2.5 to 3 mm. long, with the nerves of the flowering glume *b*) densely clothed with long hairs.—Dry soil, Utah, Colorado to Texas, and westward to Arizona. [Mexico.] July–September.



FIG. 472. **Polypogon littoralis** (With.) Smith Comp. Fl. Brit. Ed. 2, 13. 1816 (*Agrostis littoralis* With. Bot. Arr. Brit. Pl. Ed. 3, 2 : t. 23. 1796). BEARD GRASS.—A tufted, slender, or rather stout perennial, 3 to 6 dm. high, with scabrous, flat leaves and narrow, densely flowered, much lobed panicles, 5 to 12 cm. long. Spikelets, 2 to 3 mm. long, with scabrous, subulate-pointed empty glumes (*a*) and broadly truncate or emarginate, awned flowering glumes, 1 mm. long. Awn about 2 mm. long.—Wet places California and Oregon to Vancouver Island. [Europe and South America.] May, June.



FIG. 473. *Polypogon maritimus* Willd. in Nov. Act. Soc. Nat. Cur. Berol. 3: 443. 1801. (*Phleum crinitum* Roxb.) SEA-SIDE BEARD-GRASS.—An erect, slender annual 1.5 to 3 dm. high, with flat leaves and densely-flowered, spike-like panicles 2 to 4 cm. long. Spikelets with two-lobed, awned empty glumes (*a*), which are villous at the apex and twice longer than the short-awned floral glume (*b*). Awn of the empty glumes 4 to 6 mm. long.—Lower California and, according to Chapman, along the seashore of North and South Carolina. [Europe.] June.



FIG. 474. *Arctagrostis latifolia* (R. Br.) Griseb. in Ledeb. Flor. Ross. 4 : 434. 1853. (*Colpodium latifolium* R. Br. Suppl. App. Parry's Voy. 286. 1824). BROAD-LEAFED ARCTIC BENT.—A rather stout, glabrous, erect perennial 1.5 to 6 dm. high, with narrow panicles 3 to 16 cm. long. Spikelets 3 to 4 mm. long, with nearly equal empty glumes (a) shorter than the obtuse, scabrous flowering glume and palea (b).—Greenland and Labrador to Alaska. [Northern Europe and Asia.] August.



FIG. 475. *Arctagrostis arundinacea* (Trin.) Beal, Grasses N. Am., 2: 317. 1896. (*Vilfa arundinacea* Trin. Unifl., 157. 1824; Icon. t., 55. *Sporobolus arundinaceus* Vasey. *Colpodium arundinaceum* Hook.). REED BENT.—A stout perennial 6 to 12 dm. high, with flat leaves and open panicles 20 to 35 cm. long. Spikelets compressed, with nearly equal glumes (*a*) about 4.5 mm. long.—Alaska and British America. [Northeastern Asia]. July, August.



FIG. 476. *Cinna bolanderi* Scribn. Proc. Acad. Nat. Sci. Phila. 1884. 290. CALIFORNIAN REED-GRASS.—A stout, leafy, erect perennial 15 to 22 dm. high, with loose, open panicles 25 to 36 cm. long. Spikelets about 5 mm. long, with broadly lanceolate, nearly equal empty glumes (*a*), which are a little longer than the nearly sessile floret (*b*).—California, No. 6090, Bolander. August.



FIG. 477. *Cinna latifolia* (Trev.) Griseb. in Ledb. Fl. Ross. 4 : 435. 1853. (*Agrostis latifolia* Treviran, 1830; *Cinna pendula* Trin. 1841.) SLENDER INDIAN REED.—A rather slender, smooth perennial, with erect, simple culms, long, flat leaves 4 to 12 mm. wide, and open, nodding panicles 10 to 20 cm. long. Spikelets (*a*) about 3 mm. long, with nearly equal, acute outer glumes and short-awned or nearly awnless flowering glume (*b*), which is raised on a short stipe.—Thickets and moist woodlands, Newfoundland to British Columbia and southward to North Carolina and Utah. July–September.



FIG. 478. *Agrostis perennans* (Walt.) Tuckerm. Am. Journ. Sci. 45: 44. 1843. (*Cornucopia perennans* Walt. 1788.) PERENNIAL BENT OR THIN GRASS.—A slender, sparingly branched, leafy perennial, with weak, ascending culms 3 to 7.5 dm. long, and diffuse, capillary panicles 8 to 16 cm. long. Spikelets 1.5 to 2 mm. long, with acute empty glumes (*a*), which are a little longer than the glabrous flowering glume (*b*).—Damp, shaded places, Maine to Minnesota and Nebraska, southward to South Carolina and Mississippi. May–September.



FIG. 479. *Agrostis geminata* Trin. Unifl. 207. 1824. MOUNTAIN BENT.—A slender, erect, densely caespitose perennial 2 to 3.5 dm. high, with short, flat leaves, chiefly basal, and capillary, spreading panicles 5 to 8 cm. long. Spikelets 2.5 to 3 mm. long, truncate or retuse flowering glumes (*b*) about 1.7 mm. long.—British Columbia to Alaska. August.



FIG. 480. *Agrostis rubra* Linn. Sp. Pl. 62. (*A. rupestris* Chapm. not All). RED BENT.—A tufted, alpine perennial 1.5 to 4 dm. high, with narrow, flat leaves, open, capillary panicles 5 to 10 cm. long, and awned spikelets (*a*) 2.5 to 3 mm. long.—High mountains, Vermont and New Hampshire to North Carolina and Colorado; also in Labrador and Newfoundland. [Europe.] July-August.



FIG. 481. *Agrostis varians* Trin. *Agrost.*, 1²: 68. 1841. SLENDER BENT-GRASS.—A densely caespitose perennial 1 to 2.5 dm. high, with flat, erect leaves and contracted, almost spike-like panicles 3 to 5 cm. long. Spikelets 2.3 mm. long, with nearly equal, subacute empty glumes (*a*) and minutely toothed, hyaline, awnless flowering glumes (*b*) 1.7 mm. long.—Mountains of Oregon, Washington, and California. July–September.



FIG. 482. *Agrostis paludosa* Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11: 49. fig. 7, 1898. MARSH BENT.—A low, densely caespitose perennial 1 to 1.5 cm. high, with soft, narrow leaves, and narrow, rather densely flowered panicles 3 to 5 cm. long. Spikelets about 3 mm. long, with ovate-lanceolate, acute empty glumes (*a*), which are a little longer than the broadly obtuse and minutely scabrous flowering glume (*b*). Palea 0.5 mm. long.—Labrador. August, September.



FIG. 483. *Agrostis alba* Linn. Sp. Pl. 63. HERD'S GRASS or RED-TOP.—A well known perennial of variable habit, often stoloniferous, with smooth culms 3 to 9 dm. high, flat leaves, and erect, many-flowered, open panicles 4 to 18 cm. long. Spikelets 2 to 3 mm. long, with abruptly acute empty glumes (*a*), which are a little longer than the obtuse or truncate flowering glume. Palea one-half to three-fourths as long as the glume.—Throughout the United States, excepting in the extreme South. [Europe.] June-September.



FIG. 484. *Agrostis verticillata* Vill. Prosp. 16. 1779; Trin. Icon. Gram. t. 36 (*A. stolonifera* L.?) WATER BENT-GRASS.—A slender perennial, with flat leaves, erect or decumbent culms, 2 to 6 dm. long, and densely flowered, more or less interrupted panicles 5 to 25 cm. long. Spikelets about 1.5 mm. long with nearly equal, minutely pubescent, empty glumes (*a*) about one-half longer than the obtuse and minutely dentate, awnless flowering glume.—Moist places, Utah to Texas, and westward to California. [Mexico, South America, Europe, and India.] May–August.



FIG. 485. *Calamagrostis cinnoides* (Muhl.) Scribn. Mem. Torr. Club. 5:42. 1895. (*Arundo cinnoides* Muhl.; *Calamagrostis nuttalliana* Steud.). NUTTALL'S REED-GRASS.—A stout, erect perennial, 9 to 15 dm. high, with rather broad, flat leaves and contracted panicles 6 to 14 dm. long. Spikelets 6 to 8 mm. long; prolongation of the rachilla (c), bearing at its apex a tuft of hairs.—Moist soil, Maine to North Carolina and Alabama, and west to Ohio. August, September.



FIG. 486. *Calamagrostis breweri* Thurb. in Brewer & S. Wats. Bot. Calif. 2: 280. 1880. BREWER'S REED-GRASS.—A slender, densely tufted perennial, 1.5 to 4 dm. high, with numerous, setaceous involute, basal leaves, short culm leaves and open, few-flowered panicles 2 to 6 cm. long. Spikelets with nearly equal glumes which are 3 to 4 mm. long, the 4-toothed flowering glume with a small tuft of very short hairs on each side at the base and an exserted straight awn.—Mountains of California. July, August.



FIG. 487. *Calamagrostis inexpansa* A. Gray in Torr. Fl. N. Y. 2: 445, t. 152. 1843. (*Calamagrostis confinis* A. Gray, Man. Ed. 2, 547, not Nutt.?) BOG REED-GRASS.—A slender, erect perennial 3 to 6 dm. high with narrow, flat leaves and contracted panicles 5 to 18 cm. long. Spikelets 3 to 4 mm. long with nearly equal, acute empty glumes (*a*) about the length of the flowering glume, the basal hairs of which nearly equal it in length or are one-third shorter.—Damp, sandy soil, New York and New Jersey westward to South Dakota and Colorado. July–September.

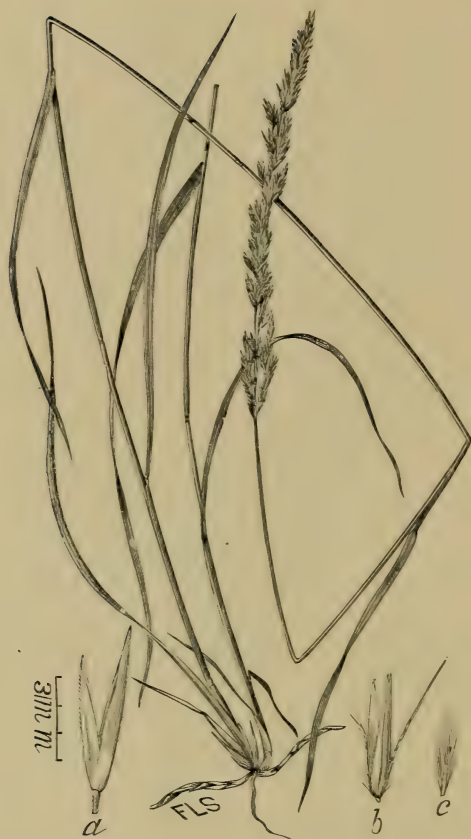


FIG. 488. *Calamagrostis porteri* A. Gray, Proc. Am. Acad. 6: 79. 1862. PORTER'S REED BENT.—A slender, erect, glabrous perennial 6 to 12 dm. high, with rough, flat leaves and narrow, rather loosely flowered panicles 8 to 16 cm. long. Spikelets 2 to 5 mm. long, with nearly equal glumes, the scabrous outer ones (*a*) very acute; the flowering glume obtuse, scabrous, with the basal hairs one-fourth to one-third its length.—Dry woodlands, New York and Pennsylvania. August.



FIG. 489. *Calamagrostis scopulorum* M. E. Jones, Proc. Calif. Acad. Sci. (2), 5 : 722. 1895. BROOM REED-GRASS.—A slender, erect perennial 5 to 8 dm. high, with flat leaves and narrow, rather loosely flowered panicles 8 to 12 cm. long. Spikelets with narrowly lanceolate, acute, empty glumes (*a*) 5 mm. long, very short-awned or nearly awnless flowering glumes about 4 mm. long, and short callus hairs.—Wahsatch Mountains, Utah. September.



FIG. 490. *Calamagrostis vaseyi* Beal, Grasses N. Am. 2 : 344. 1896. VASEY'S REED-GRASS.—A densely caespitose, erect perennial, 6 to 7.5 dm. high, with flat and rather rigid leaves and contracted, spike-like, often interrupted panicles 6 to 8 cm. long. Spikelets about 4.5 mm. long; flowering glume 3 mm. long with a nearly straight awn 3 to 4 mm. long.—Mountains of Washington and Oregon. July, August.



FIG. 491. *Calamagrostis purpurascens* R. Br. in Rich. App. Frankl. Journ. 731. 1823. PURPLE REED-BENT.—A rather rigid, densely caespitose, erect perennial 3 to 6 dm. high, with firm, strongly involute leaves and densely flowered, spike-like panicles 6 to 8 cm. long. Spikelets 6 to 7 mm. long; flowering glumes (*b*) about 4.5 mm. long; awn much exceeding the glumes.—Dry, rocky soil in the mountains, Colorado to California and northward to Alaska. July, August.



FIG. 492. *Calamagrostis macouniana* Vasey, Contr. Nat. Herb. 3:81. 1892. (*Deyeuxia macouniana* Vasey, Coult. Bot. Gaz. 10:297. 1885.) MACOUN'S REED-BENT.—A slender, erect, leafy perennial 3 to 6 dm. high, with narrow, flat leaves and narrow or (in anthesis) open, pyramidal panicles 6 to 8 cm. long. Spikelets with nearly equal empty glumes (*a*) about 3 mm. long, scarcely exceeding the short-awned flowering glume.—Moist sandy soil, Assiniboia to Missouri, Montana, and Washington. May–August.



FIG. 493. *Calamagrostis fasciculata* Kearney, U. S. Dept. Agr., Div. Agros., Bull. 11: 23, fig. 1. July, 1898. COUCH BENTGRASS.—A slender, rather rigid, erect perennial 6 to 10 dm. high, from creeping rootstocks, with narrow, mostly erect leaves and contracted panicles 5 to 10 cm. long. Spikelets about 4 mm. long, with a truncate and 4-dentate floral glume, which has a few short hairs at the base and bears an awn on the back below the middle, which usually exceeds the glume.—Mendocino and Marin counties, Cal. July, August.



FIG. 494. *Calamagrostis langsdorffii* Trin. Gram. Unifl. 225, t. 4, f. 10. 1824. LANGSDORF'S REED-BENT.—A stout, erect perennial 6 to 12 dm. high, with long, flat leaves and open, pyramidal panicles 4 to 12 cm. long. Spikelets with long-acuminate, scabrous, empty glumes (*a*) 4 to 6 mm. long.—Moist meadows, etc., Newfoundland to Alaska and southward to the mountains of New England, Colorado, Utah, and northern California. June-September.



FIG. 495. *Calamovilfa curtissii* (Vasey) Scribn. n. comb. (*Calamagrostis curtissii* Vasey, Contrib. Nat. Herb. **3**: 85. 1892; *Ammophila curtissii* Vasey, Bull. Torr. Bot. Club, **11**: 7. 1884.) SOUTHERN REED-GRASS.—A rather slender, wiry, erect perennial 9 to 18 dm. high, from a stout rhizome, with narrow, involute leaves and a contracted panicle 16 to 20 cm. long. Spikelets about 5 mm. long, with unequal empty glumes (*a*) and more or less hairy flowering glume and palea (*b*) bearing a few short hairs on the callus.—Low pine barrens, Florida. July, August.



FIG. 496. *Trisetum muticum* (Boland.) Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11: 50, fig. 10. July, 1898. (*Trisetum subspicatum* var. *muticum* Bol.; *Trisetum wolfii* Vasey, in part.) BEARDLESS FALSE OAT.—A rather stout or more often slender, erect, caespitose perennial, 3 to 7.5 dm. high with flat, glabrous, sometimes pilose leaves, narrow or densely flowered panicles 8 to 18 cm. long.—Dry situations, Montana to British America and southward to California, Wyoming, and Colorado. July–September.



FIG. 497. *Trisetum wolfii* Vasey, in Bot. Wheeler Exped. 6: 294, t. 27. 1878. WOLF'S FALSE OAT.—A slender, erect, tufted perennial, with rather short, flat, scabrous leaves and loosely-flowered, nodding and contracted panicles 5 to 10 cm. long. Spikelets 2-flowered, 5 to 6 mm. long, with lanceolate, very acute, nearly equal empty glumes (*a*) and acute, punctate-scabrous, short-awned flowering glumes (*c*).—Mountains of Colorado. August.



FIG. 498. *Trisetum argenteum* Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11:49, fig. 8. July, 1898. SILVER OAT-GRASS.—A slender, erect perennial, with smooth culms 5 to 7 dm. high, minutely scabrous sheaths and leaves and narrow, silvery gray or purplish panicles 10 to 20 cm. long. Spikelets 4 to 5 mm. long, 1- to 2-flowered, with unequal, acute, empty glumes and minutely scabrous, short-awned flowering glumes, the first one of which is about 4 mm. long.—Near Silverton and Twin Lakes, Colorado. August.



FIG. 499. *Avena fatua* Linn. Sp. Pl. 80. WILD OAT.—An erect, glabrous annual 6 to 12 dm. high, with flat leaves and spreading panicles of large oat-like, nodding spikelets. Spikelets 2-to 4-flowered, with long (1.5 to 2 cm.) empty glumes (a) and pubescent flowering glumes (b) 12 to 18 mm. long. Awns nearly twice as long as the spikelets.—Fields and waste places from Minnesota westward; abundant in grain fields on the Pacific slope. [Introduced from Europe.] June–September.



FIG. 500. *Bouteloua polystachya* (Benth.) Torr. in Pacif. Rail. Rep. 5:366, t. 10. 1857. (*Chondrosium polystachyum* Benth. Bot. Voy. Sulph. 56. 1844.) SIX-WEEKS GRAMA.—A slender and diffusely spreading, much-branched annual, 1 to 4 dm. high, with short, narrow leaves and 3 to 6 linear spikes about 2 cm. long, approximate near the apex of the culm or its branches. Spikelets with glabrous, unequal empty glumes (*a*), the larger second one 1.5 mm. long, and 4-lobed flowering glumes (*b*), which are awned between the lobes and ciliate on the nerves.—River valleys, etc., Utah to Texas and westward to southern California. [Mexico.] July–September.



FIG. 501. *Bouteloua prostrata* Lag. Varied. Cienc. 2⁴: 141. 1805. TUFTED GRAMA.—A slender, tufted annual, 1 to 2 dm. high, with short, narrow leaves and solitary, curved, terminal spikes 1.5 to 2 cm. long. Spikelets with very unequal, glabrous empty glumes (*a*), the second about 4 mm. long, and broadly oblong, 3-lobed and 3-awned flowering glumes which are pubescent on the back below.—Common on bottom lands, New Mexico, Colorado, and (?) Arizona. [Mexico.] June–October.



FIG. 502. *Bouteloua bromoides* Lag. Gen. Sp. Nov. 5. 1816. (*Dinebra bromoides* H. B. K.) SPRUCE-TOP.—A rather stout, erect perennial 3 to 6 dm. high, with flat leaves and 5 to 7 more or less spreading spikes, racemose along the upper portion of the culm. Spikelets 5 to 11 in each spike; flowering glume 5 to 6 mm. long, with 3 short awns; imperfect floret (c) raised on a short stipe, and with 3 long awns and a palea.—New Mexico and Arizona. [Mexico.] August, September.



FIG. 503. *Orcuttia greenii* Vasey, Coult. Bot. Gaz. **16** : 146. 1891; Ill. N. Am. Grasses, **2** : 50. CHICO GRASS.—A rigid, caespitose, and more or less branching, leafy annual 1 to 2.5 dm. high, with narrow and rather densely flowered spikes 2 to 6 cm. long. Spikelets (*a*) compressed, 8 to 12 mm. long, 9- to 15-flowered, with many-nerved, papillate-pilose and dentate glumes.—Chico, Cal. June.



FIG. 504. *Blepharidachne kingii* (S. Wats.) Hackel in DC. Monog. Phan. 6 : 261. 1889. (*Eremochloë kingii* S. Wats. in Bot. King's Exped. 382, t. 40. 1871.) KING'S DESERT-GRASS.—A low, densely tufted perennial 0.2 to 0.6 dm. high, with numerous short, spreading, recurved leaves and densely flowered, subcapitate panicles partly inclosed in the upper leaf-sheaths. Spikelets about 3-flowered, with lanceolate, acute empty glumes (*a*) 6 to 7 mm. long. Flowering glumes (*b*) densely hairy at the base and along the keel and marginal nerves, the nerves extending into short awns, the middle one longest (*c*).—Dry foothills in the deserts of Nevada and Arizona. April-July.



FIG. 505. *Triodia mutica* (Torr.) Scribn. Bull. Torr. Bot. Club 10:30. 1883. (*Tricuspis mutica* Torr. Pac. R. Ry. Rept. 4:156. 1857.) SLENDER TRIODIA.—A slender, wiry, erect perennial 3 to 5 dm. high, with short, narrow leaves and contracted panicles 10 to 20 cm. long. Spikelets 5- to 8-flowered, 8 to 10 mm. long, with obtuse or emarginate flowering glumes (c) which are pubescent on the keel and marginal nerves near the base.—Dry hillsides, Texas and Arizona. [Mexico.] April-October.



FIG. 506. *Triodia trinerviglumis* Vasey, Ill. N. Am. Grasses, 1²: No. 40. 1891. WIRY TRIODIA.—A slender, erect, caespitose perennial 6 to 10 cm. high, with narrow leaves and contracted, spike-like panicles 8 to 16 cm. long. Spikelets 7- to 9-flowered, 6 to 10 mm. long; flowering glumes (*b*) 4 to 5 mm. long and pubescent on the nerves below.—Dry soil, Missouri to Arkansas and west to Colorado and Arizona. June-September.



FIG. 507. *Triodia stricta* (Nutt.) Vasey, Ill. N. Am. Grasses 1²., No. 38. 1891. (*Windsoria stricta* Nutt.) SPIKED TRIODIA.—A stout, erect, caespitose perennial 12 to 14 dm. high, with rather long, rigid leaves and densely flowered, spike-like panicles 10 to 30 cm. long. Spikelets nearly sessile, 5- to 8-flowered, 4 to 5 mm. long, with lanceolate, acute empty glumes (*a*) and oblong, obtuse flowering glumes (*c*) which are 2 to 3 mm. long.—Moist soil, Louisiana and Mississippi to Kansas and Texas. August–October.



FIG. 508. *Sieglingia decumbens* Bernh. Syst. Verz. d. Erfurth. Pl. 40. 1800. (*Triodia decumbens* Beauv. Agrost. 67. 1812. *Festuca decumbens* Linn.) HEATHER-GRASS.—An erect or often decumbent, glabrous perennial, with narrow leaves and simple, contracted panicles 2 to 4 cm. long. Spikelets (a) 3- to 5-flowered, 6 to 10 mm. long, with acute empty glumes and obtusely 3-toothed flowering glumes (c) which are ciliate on the margins below.—Newfoundland. Introduced. [Europe, Asia.] August, September.



FIG. 509. **Triplasis purpurea** (Walt.) Chap. Fl. So. St. 559. (*Aira purpurea* Walt. Fl. Car. 78. 1788. *Tricuspis purpurea* A. Gray; *Sieglingia purpurea* Kuntze.) PURPLE SAND-GRASS.—A smooth, erect or spreading, caespitose perennial 3 to 9 dm. high, with narrow, rigid leaves and simple panicles 2 to 6 cm. long. Spikelets 2- to 5-flowered, 5 to 8 mm. long, with smooth empty glumes (*a*) and hairy, 2-lobed and short-awned flowering glumes (*d*).—In sandy soil along the coast, from Maine to Florida and westward to Nebraska and Texas. July–October.



FIG. 510. *Molinia caerulea* (L.) Moench, Meth. 183. 1794. (*Aira caerulea* L. Sp. Pl. 63; *Enodium caeruleum* Gaud.) MOLINIA.—A rather coarse and rigid perennial 6 to 10 dm. high, with rather stiff leaves and narrow, usually purplish panicles 15 to 30 cm. long. Spikelets 2- to 4-flowered, 5 to 8 mm. long, with obtuse, 3-nerved flowering glumes about 4 mm. long.—Sparingly introduced by ships' ballast and in waste places. [Europe.] August, September.



FIG. 511. *Eragrostis major* Host, Gram. Austr. 4: 14, pl. 24. 1809. (*Eragrostis poaeoides* var. *megastachya* A. Gray.) CANDY-GRASS.—A rather showy, much-branched annual, with erect or ascending stems 1.5 to 9 dm. high. Spikelets (*a*, *b*) 5- to 40-flowered, 5 to 16 mm. long and about 3 mm. wide.—Naturalized in cultivated or waste ground, usually in sandy soil, almost everywhere in the United States and in Ontario. [Europe, Asia, naturalized in tropical America.] June-October.



FIG. 512. *Eragrostis pilosa* (Linn.) Beauv. Agrost. 162. 1812. (*Poa pilosa* L. Sp. Pl. 68.) SLENDER MEADOW-GRASS.—A slender, branching annual 1.5 to 4.5 dm. high, with narrow, flat leaf-blades and open, capillary panicles of small, appressed, 5- to 12-flowered spikelets (*a*) 3 to 6 mm. long.—In cultivated fields, roadsides, and sandy shores, Massachusetts to Illinois and Kansas, south to Florida, Texas, and Arizona. [Widely distributed in tropical and warm temperate countries.] June-September.



FIG. 513. *Eragrostis trichodes* (Nutt.) Nash, Bull. Torr. Bot. Club 22:465. 1895. (*Poa trichodes* Nutt.; *Eragrostis tenuis* A. Gray, not Steud.) BRANCHING SPEAR-GRASS.—A tall perennial 6 to 15 dm. high, with rather narrow, elongated, many-flowered panicles and somewhat rigid leaves. Spikelets 3- to 10-flowered, 5 to 10 mm. long, with acute glumes.—Sand-hills and prairies, Illinois to Nebraska, Indian Territory and Texas. July–September.



FIG. 514. *Eragrostis capillaris* Nees, Agrost. Bras. 505. 1829.
 (*Poa capillaris* Linn. Sp. Pl. 68; *Poa tenuis* Ell.) LACE-GRASS.—
 An erect annual, 15 to 60 cm. high, branching at the base, with
 an oblong-ovoid, widely expanded panicle of very small 2- to
 4-flowered spikelets, 2 to 3 mm. long.—Dry, sandy fields and road-
 sides, Rhode Island to Illinois and Missouri, south to Georgia
 and Texas. August, September.



FIG. 515. *Eragrostis obtusiflora* Scribn. U. S. Dept. Agr., Div. Agros. Bull. 8: 10, Plate 5. May, 1897. MEXICAN SALT-GRASS.—A rigid, erect, branching perennial 3 to 5 dm. high, from strong, scaly rootstocks, with stiff, pungent-pointed leaves, and more or less spreading panicles 8 to 14 cm. long. Spikelets 5- to 12-flowered, 7 to 15 mm. long, the rigid flowering glumes obtuse and about 4.5 mm. long.—Sandy, alkaline soil, Arizona. Resembles salt-grass (*Distichlis spicata*) in habit. August, September



FIG. 516. *Eragrostis secundiflora* Presl, Reliq. Haenk. 1:276. 1830. (*Eragrostis oxylepis* Torr.; *Poa interrupta* Nutt. not Lam.) PURPLE LOVE-GRASS.—A smooth perennial 1.5 to 9 dm. high, with rather rigid, narrow leaves and contracted or open panicles 3 to 12 cm. long. Spikelets (*a*, *b*) crowded, strongly compressed, 8- to 40-flowered, 6 to 20 mm. long, with acute glumes.—Dry soil, Florida, Alabama and westward to Kansas, Indian Territory, Texas, and California. [Mexico and Central America.] July-November.



FIG. 517. *Anthochloa colusana* (Davy), Scribner, n. comb. (*Stapfia colusana* Davy, Eryth. 6: 110. 1898; *Neostapfia colusana* Davy, Eryth. 7: 43. 1899.)—A densely caespitose, spreading or ascending, glabrous annual (?) with loose sheaths, rather short, flat leaves, and densely flowered, oblong or cylindrical, spike-like panicles 3 to 7 cm. long. Spikelets (*a*) usually 3- to 5-flowered, 6 to 7 mm. long, with very broad, flabelliform, ciliate-fringed flowering glumes (*c*) about 5 mm. long. Lower empty glumes, when present, narrowly lanceolate.—Uncultivated alkali "goose-lands." Colusa County, California.



FIG. 518. *Melica imperfecta* Trin. Gram. Suppl. Bull. Sc. Acad. St. Petersburg. 1:68. 1836; Icon. Gram. t. 355. (*M. colpodoides* Nees; *M. panicoides* Nutt.) SMALL-FLOWERED MELIC-GRASS.—A somewhat slender, erect perennial 6 to 9 dm. high, with narrow, flat leaves and more or less diffusely spreading, many-flowered panicles. Spikelets 1- to 2-flowered, 3 to 5 mm. long, with the empty glumes (*a*) shorter than the spikelet; rudimentary floret sessile or nearly so.—Hillsides and grassy mountain slopes, California. [Lower California.] March–July.



FIG. 519. *Melica torreyana* Scribn. Proc. Acad. Nat. Sci. Phila. 1885:47. TORREY'S MELIC-GRASS.—A slender, leafy, caespitose perennial 6 to 9 dm. high, with flat leaves and more or less spreading panicles 12 to 20 cm. long. Spikelets usually 1-flowered, with the rudiment of a second flower raised upon a long pedicel; empty glumes (a) as long as or exceeding the flowering glume, which is minutely pubescent toward the apex.—California. May–September.



FIG. 520. *Melica fugax* Boland. Proc. Calif. Acad. Sci. 4: 104. 1870; Vasey, Ill. N. Amer. Grasses 2: Pl. LXV. SMALL MELIC-GRASS.—A slender, erect perennial, 1.5 to 3.5 dm. high, from a bulbous base, with flat leaves and few-flowered, narrow panicles 8 to 16 cm. long. Spikelets 6 to 8 mm. long, 3- to 5-flowered; glumes obtuse, the floral ones about 4 mm. long.—Low grounds in open pine woods, dry mountain sides, etc., Washington to California. May-June.



FIG. 521. *Melica longiligula* Scribn. & Kearney, sp. nov.—A slender, erect, caespitose perennial, 6 to 7 dm. high, with narrow leaves, and strict, more or less interrupted panicles 15 to 20 cm. long. Spikelets 3- to 5-flowered, 6 to 8 mm. long, on short, pubescent pedicels; glumes obtuse, minutely scabrous, the outer ones unequal, the larger second one 5 to 5.5 mm. long; the first flowering glume 5 to 6 mm. long. Ligule 5 to 6 mm. long.—Southern California (No. 865. Parish Brothers, 1881).



FIG. 522. *Melica californica* Scribn. Proc. Acad. Nat. Sci. Phila. 1885: 46. (*M. poroides* Torr. in Pacif. R. Ry. Rep. 4: 157, not Nutt.; *M. bulbosa* Thurb. in Brewer and S. Wats. Bot. California, 2: 304, not Geyer). CALIFORNIA MELIC-GRASS.—A slender, erect perennial, from a bulb-like base. 3 to 9 dm. high, with very narrow leaves and contracted, densely flowered panicles 8 to 16 cm. long. Spikelets about 8 to 10 mm. long, usually with three perfect flowers: flowering glumes obtuse, the first one about 8 mm. long.—Dry slopes and ridges, California. April-June.



FIG. 523. *Melica frutescens* Scribn. Proc. Acad. Nat. Sci. Phila. 1885: 45, pl. 1, figs. 15 and 16. WOODY MELIC-GRASS.—A stout, leafy perennial, 6 to 10 dm. high, somewhat woody at the base, with flat, scabrous leaves and rather densely-flowered, strict panicles 10 to 30 cm. long. Spikelets usually 5-flowered, about 12 mm. long, with the empty glumes (*a*) nearly as long, the first floral glume obtuse, and about 8 mm. long.—Southern California. [Lower California, Mexico.] April-June.



FIG. 524. *Melica inflata* Vasey, Contrib. Nat. Herb. 1: 269. 1893.
 INFLATED MELIC-GRASS.—An erect, leafy perennial, 9 to 18 dm.
 high, bulbous at the base, with spreading, simple panicles 12 to
 20 cm. long. Spikelets 12 to 18 mm. long, 6- to 8-flowered, with
 subacute, scabrous flowering glumes (*b*) about 8 mm. long.—
 Mountains of California. June, July.
 Allied to *M. californica*.



FIG. 525. *Melica harfordii* Boland. Proc. Calif. Acad. Sci. 4: 102. 1870; Thurb. in Brewer and S. Wats. Bot. California 2: 305. HARFORD'S MELIC-GRASS.—A rather slender, erect, wiry perennial, 6 to 15 dm. high, with narrow, flat leaves and erect, narrow, light-green or straw-colored panicles, 10 to 20 cm. long. Spikelets 12 to 16 mm. long, 4- to 8-flowered, the flowering glumes 8 mm. long, usually short-awned, and ciliate with long, shining hairs for two-thirds of the margin below.—Mountains of California, Oregon, and Washington. June, July.



FIG. 526. *Melica subulata* (Bong.) Scribn. Proc. Acad. Nat. Sci. Phila. 1885. 47. (*Festuca subulata* Bong. Veg. Sitch. 173. 1831; *Melica acuminata* Boland.) SLENDER-FLOWERED MELIC-GRASS.—An erect, leafy perennial, 9 to 12 dm. high, from a bulbous base, with flat leaves and rather lax panicles 10 to 20 cm. long. Spikelets 3- to 5-flowered, with long-attenuate pointed flowering glumes, about 12 mm. long, ciliate on the margins and hirsute on the back below.—Shaded canyons and damp woodlands, British Columbia to California, east to Montana. May–September.



FIG. 527. *Melica smithii* (Porter) Vasey, Bull. Torr. Bot. Club 15: 294. 1888. (*Avena smithii* T. C. Porter.) SMITH'S MELIC-GRASS.—A slender, erect perennial, 5 to 10 dm. high, with flat leaves, and spreading panicles 12 to 24 cm. long. Spikelets 3- to 6-flowered, 20 mm. long, with unequal empty glumes and awned, glabrous flowering glumes (*b*) about 10 mm. long. Awn one-fourth to one-half as long as the glume.—Moist woodlands Michigan, Montana, Washington, and British Columbia. June–August. Allied to *M. aristata*. Thurb.



FIG. 528. *Melica aristata* Thurb. in Brew. & Wats. Bot. Calif. 2: 305; Bol. Proc. Calif. Acad. 4: 103. BEARDED MELIC GRASS.—A slender, tufted perennial, 4 to 10 dm. high, with flat, usually pubescent leaves and narrow panicles 10 to 25 cm. long. Spikelets 3- to 5-flowered, with unequal empty glumes (*a*), and awned flowering glumes, which are 10 to 12 mm. long and have a few stiff, marginal hairs near the base. Awn 8 to 14 mm. long.—Washington to California. June, July.



FIG. 529. *Pleuropogon californica* (Nees) Vasey, Ill. N. Am. Grasses 2: No. 68. 1893; (*Lophochlana californica* Nees Ann. Nat. Hist. (ser. 1.) 1: 283. 1838; Hook. & Arnot, Bot. Beechy 403, t. 95.) CALIFORNIA PLEUROPOGON.—A pale green, tufted perennial, with soft or rather weak culms 3 to 6 dm. high, flat leaves, and terminal racemes of 6 to 12 erect or spreading spikelets about 2 cm. long. Flowering glumes scabrous, about 6 mm. long, with a rough awn of nearly equal length.—Low, moist grounds, California. May.



FIG. 530. *Uniola longifolia* Scribn. Bull. Torr. Bot. Club **21**: 229. 1894. LONG-LEAFED SPIKE-GRASS.—A rather stout, perennial 6 to 12 dm. high, with long (the lower ones 30 cm.), flat leaves, and narrow panicles 15 to 45 cm. long. Spikelets (*a*) 3- to 4-flowered, 7 to 8 mm. long, with 9- to 11-nerved flowering glumes, 3.5 to 5 mm. long. Lower sheaths more or less pubescent.—In dry soil, low woods, and thickets, or in hummock land, East Tennessee to Florida, Texas, and Indian Territory. June–September.



FIG. 531. *Uniola sessiliflora* Poir. Encyc. 8: 185. 1806. (*Uniola nitida* Ell.). SHORT-STALKED UNIOLA.—A rather slender, wiry perennial 3.5 to 9 dm. high, with flat, spreading leaves, and simple, rigid panicles 5 to 20 cm. long. Spikelets (a) strongly flattened, 6- to 8-flowered, 12 to 16 mm. long, with sharply acuminate-pointed empty glumes 6 to 8 mm. long.—On hummocks in shady swamps near the coast, Georgia to Louisiana. June–October.



FIG. 532. *Distichlis texana* (Vasey) Scribn. new comb. (*Poa texana* Vasey, Contrib. Nat. Herb. 1: 60. 1890; *Sieglingia wrightii* Vasey, loc. cit., 269. 1893.)—A rather stout, rigid, glabrous, creeping or stoloniferous perennial 3 to 6 dm. high, with flat leaves and densely flowered, narrow panicles 10 to 20 cm. long. Staminate spikelets (a) compressed, 5- to 7-flowered; pistillate spikelets subterete, fusiform, 12 to 25 mm. long.—Western Texas, New Mexico (No. 2038 C. Wright). [Mexico.]



FIG. 533. *Poa annua* Linn. Sp. Pl. 68. LOW SPEAR-GRASS or SUMMER-GRASS.—A low, tufted annual, with erect or ascending, somewhat flattened stems 0.5 to 3 dm. high, smooth, flat, spreading leaves, and short, pyramidal panicles. Spikelets (*a*) 3- to 6-flowered, about 4 mm. long, with slightly unequal empty glumes and obtuse flowering glumes which are hairy on the nerves below and pilose at the base.—Fields and waste places, dooryards, etc., throughout the United States and British America. [Europe.] April-September.



FIG. 534. *Poa bigelovii* Vasey & Scribn. Contrib. U. S. Nat. Herb. 1: 270. 1893. BIGELOW'S BLUE-GRASS.—A slender, smooth annual 1 to 6 dm. high, with flat leaves and narrow panicles 4 to 12 cm. long. Spikelets (*a*) 4 to 6 mm. long, 3- to 5-flowered, with the acute empty glumes nearly as long as the flowering ones, which are 3 to 4 mm. long, and villous on the keel and on the lower half of the marginal nerves, with long, cobwebby hairs at the base.—Moist soil, Colorado southward to Texas, New Mexico, Arizona, and California. [Mexico.] April-July.



FIG. 535. *Poa debilis* Torr. Fl. N. Y. 2:459. 1843. SLENDER SPEAR-GRASS.—A slender, erect, smooth perennial 3 to 7 dm. high, with rather short, flat leaves and nodding, few-flowered, open panicles 4 to 12 cm. long. Spikelets 3 to 4 mm. long, 2- to 4-flowered with unequal, acute empty glumes (*a*), broadly obtuse and scarious-tipped flowering glumes which are conspicuously webbed at the base.—In rocky woodlands, Nova Scotia and New Brunswick, southward to Pennsylvania and westward to Minnesota. May–July.



FIG. 536. *Poa alsodes* A. Gray, Man. Ed. 2:562. 1856. WOODLAND BLUE-GRASS.—A slender, erect, smooth perennial 2 to 6 dm. high, with flat leaves and open panicles 9 to 20 cm. long. Spikelets (a) 5 mm. long, 2- to 3-flowered, with very acute glumes, the outer ones unequal, the flowering glumes (b) about 4 mm. long with a long tuft of cobwebby hairs at the base.—Thickets and open woodlands, Nova Scotia to Ontario and Minnesota, southward to North Carolina and Tennessee. May, June.



FIG. 537. *Poa leptocoma* Bong. de Veget. ins. Sitch. 170. 1831.
 SLENDER MOUNTAIN BLUE-GRASS.—A slender, erect perennial,
 about 3 dm. high, with flat leaves and delicate, open panicles, 4 to
 8 cm. long. Spikelets 3-flowered, about 6 mm. long, with slightly
 unequal empty glumes (*b*) and linear-lanceolate flowering glumes,
 which are villous on the keel and marginal nerves below, and
 webbed at the base.—Wet, boggy places, mountains of Colorado,
 northward to Alaska. July, August.



FIG. 538. *Poa reflexa* Vasey & Scribn. Contrib. Nat. Herb., 1: 276. 1893. NODDING BLUE-GRASS.—A slender, erect perennial, with soft, flat leaves and open, pyramidal panicles with capillary, rather distant and finally reflexed branches. Spikelets (*a*) 3 to 4 mm. long, 2- to 3-flowered; empty glumes nearly equal; flowering glumes ovate-lanceolate, obtuse, pubescent on the middle and lateral nerves, and webbed at the base.—Wet, boggy places, mountains of Wyoming and Colorado to Washington and British America. July, August.



FIG. 539. *Poa trivialis* Linn. Sp. Pl. 67. ROUGH-STALKED MEADOW-GRASS.—An erect, usually slender perennial 3 to 9 dm. high, with flat leaves and open, many-flowered panicles, 6 to 15 cm. long. Culms usually rough near the panicle. Spikelets 2- to 3-flowered, about 3 mm. long, with very acute empty glumes (*a*), and strongly 5-nerved flowering glumes, silky-pubescent on the keel below and with long, cobwebby hairs at the base.—Meadows and roadsides throughout. [Europe.] May–August.



FIG. 540. *Poa occidentalis* Vasey, Contr. Nat. Herb. 1: 274. 1893. WESTERN BLUE-GRASS.—A slender or somewhat stout, leafy perennial 5 to 8 dm. high, with open, loosely flowered panicles 15 to 30 cm. long. Spikelets 4 to 6 mm. long, mostly 3-flowered, with acute empty glumes and obtuse floral glumes, which are 3 to 4 mm. long and slightly pubescent on the keel below, with a distinct tuft of cobwebby hairs at the base.—In moist soil, New Mexico northward to Colorado and Wyoming; also (?) Alaska. June–September.



FIG. 541. *Poa tracyi* Vasey, Bull. Torr. Bot. Club, 15:49. 1888.
 TRACY'S BLUE-GRASS.—A rather stout, erect perennial 5 to 10 dm.
 high, with flat leaves and open panicles 15 to 25 cm. long. Spike-
 lets clustered near the ends of the branches, 3- to 4-flowered,
 about 5 mm. long, with obtuse glumes, the floral ones nearly 4 mm.
 long and white pubescent on the back below, ciliate-hairy on the
 marginal nerves and keel.—Moist soil, Colorado and New Mexico.
 June–August.



FIG. 542. *Poa arachnifera* Torr. Marcy. Expd. Red Riv. Bot. 301. 1853. TEXAS BLUE-GRASS.—A hardy perennial 3 to 9 dm. high, with strong, creeping rootstocks, long, flat leaves, and narrow, rather densely flowered panicles. Spikelets ovate-lanceolate, 3- to 7-flowered, 4 to 8 mm. long, with acute empty glumes, and (in the fertile plants) very hairy flowering glumes.—A native of Texas, and introduced into cultivation in some of the Southern States. April-June.



FIG. 543. *Poa fendleriana* (Steud.) Vasey, Ill. N. Am. Grasses, 2 : 74. 1893, in part. (*Eragrostis fendleriana* Steud., Gram, 278. 1855. FENDLER'S BLUE-GRASS. MUTTON GRASS.—An erect, caespitose perennial 3 to 6 dm. high, with numerous, rather narrow basal leaves and narrow panicles 4 to 8 cm. long. Spikelets 4- to 8-flowered, 7 to 8 mm. long. Flowering glumes pubescent below on the keel and marginal nerves, otherwise smooth.—Mesas and dry hills, Colorado to Arizona and California. April-June.



FIG. 544. *Poa compressa* Linn. Sp. Pl. 69. CANADA BLUEGRASS.—A slender but rather rigid and somewhat wiry perennial, with strongly flattened stems 1.5 to 5 dm. high, and usually small, narrow, few-flowered panicles. Spikelets (*a*) 3- to 5- (rarely 7- to 9-) flowered, 4 to 6 mm. long, with acute 3-nerved empty glumes and rather firm, obscurely nerved flowering glumes 2 to 3 mm. long, sparingly pubescent toward the base.—Dry meadows and waste places, Newfoundland to South Carolina, Tennessee and westward. [Europe.] May-September.



FIG. 545. *Poa bolanderi* Vasey, Coult. Bot. Gaz. 7:32. 1882, Ill. N. Am. Grasses, 2: 73. BOLANDER'S SPEAR-GRASS.—A smooth, loosely tufted, erect perennial 3 to 6 dm. high, with short, flat leaves and spreading panicles 8 to 12 cm. long. Spikelets (*a*) 1- to 3-flowered, 3 to 4 mm. long, with unequal empty glumes and ovate-oblong flowering glumes (*b*), which are about 2.5 mm. long and nearly smooth except for a slight web at the base.—Mountains of California and Oregon. March–August.



FIG. 546. *Poa nemoralis* Linn. Sp. Pl. 69. NORTHERN SPEAR-GRASS or WOOD MEADOW-GRASS.—A slender, erect, and rather rigid perennial 1.5 to 6 dm. high, with narrow, flat leaves and usually open panicles 4 to 10 cm. long. Spikelets 2- to 5-flowered, 3 to 5 mm. long, with very acute empty glumes (*a*) and faintly nerved flowering glumes, which are 2 to 3 mm. long and webbed at the base.—Dry or rather moist soil, Labrador and Newfoundland to Pennsylvania, westward to British Columbia, Idaho, and Colorado. [Europe, Asia.] June–September.



FIG. 547. *Poa lettermani* Vasey, Contrib. Nat. Herb. 1: 273. 1893. LETTERMAN'S BLUE-GRASS.—A densely tufted, low perennial 0.5 to 1 dm. high, with loose sheaths, short, flat leaves and oblong, rather densely-flowered panicles 1 to 2 cm. long. Spikelets 3 to 4 mm. long, with rather broad and nearly equal empty glumes (*a*) exceeding in length the adjacent flowering glumes, which are 2 to 3 mm. long, obscurely nerved, obtuse, and glabrous.—Summits of high mountains, Colorado. July, August.



FIG. 548. *Poa pattersoni* Vasey, Contrib. Nat. Herb. 1:275. 1893. PATTERSON'S BLUE-GRASS.—A low, densely tufted perennial 1 to 1.5 dm. high, with numerous basal leaves, 4 to 6 cm. long and oblong, densely flowered panicles. Spikelets 2- to 3-flowered 4 to 6 mm. long with nearly equal, acute empty glumes nearly as long as the floral ones (4 mm.) which are pubescent on the lateral nerves and keel below the middle but not webbed.—High mountains of Colorado. August.



FIG. 549. *Poa pringlei* Scribn. Bull. Torr. Bot. Club **10**: 31. 1883. PRINGLE'S BLUE-GRASS.—A densely tufted perennial from a creeping rootstock, with rather firm, spreading, smooth, narrow leaves and slender, scape-like culms 1 to 1.5 dm. high. Panicles contracted, few-flowered, usually about 2 cm. long. Spikelets 3- to 5-flowered, 6 to 8 mm. long.—Moist places, high mountains, California and (?) Oregon and Washington. August, September.



FIG. 550. *Poa leckenbyi* Scribn. U. S. Dept. Agr., Div. Agros., Cir. 9:2. 1899. SAND BLUE-GRASS.—A pale green, tufted perennial 6 to 8 dm. high, with long, narrow, flat leaves, somewhat inflated, persistent basal sheaths and pale, rather narrow panicles about 10 to 15 cm. long. Spikelets oblong-lanceolate, 5- to 6-flowered, 9 to 11 mm. long, with subequal, 3-nerved, acute empty glumes (*a*) and scarious-margined flowering glumes (*c*), which are pubescent on the back below, especially on the keel and marginal nerves.—Dry and very sandy soil, Washington. June.

A valuable hay grass for very sandy soils.



FIG. 551. *Poa nevadensis* Scribn. Bull. Torr. Bot. Club 10: 66. 1883. NEVADA BLUE-GRASS.—An erect, rather stout perennial, with flat leaves and narrow panicles 10 to 25 cm. long. Spikelets lanceolate-oblong, 3- to 8-flowered, 6 to 12 mm. long, with slightly unequal empty glumes (*a*) and oblong-elliptical, usually obtuse, flowering glumes, which are 4 to 5 mm. long and strongly scabrous on the keel.—Moist soil, North Dakota to British Columbia, and southward to Nebraska and Nevada. May–August.



FIG. 552. *Poa lucida* Vasey, Contrib. Nat. Herb. 1: 274. 1893. YELLOW SPEAR-GRASS.—A slender, tufted perennial, 4 to 6 dm. high, with flat leaves and narrow but lax panicles 10 to 15 cm. long. Spikelets (*a*) 6 to 8 mm. long, 3- to 4-flowered, with obtuse glumes, the flowering ones 4 mm. long and slightly pubescent on the keel and lateral nerves near the base.—Dry, rocky places, moist brook-sides, canyons, etc., alt. 1,500-3,300 m.; mountains of Colorado, Wyoming, Montana, and British Columbia. July-September.



FIG. 553. *Poa unilateralis* Scribn. in Vasey Ill. N. Am. Grasses, 2^d: No. 85. 1893. ONE-SIDED BLUE-GRASS.—An erect, densely tufted, leafy perennial, 2.5 to 5 dm. high, with soft, narrow, basal leaves and densely flowered, usually one-sided panicles 2 to 6 cm. long. Spikelets 4- to 7-flowered, with acute glumes, the floral ones 4 mm. long, a little pubescent near the base, but not webbed.—Bluffs along the coast, California. April, May.



FIG. 554. *Poa gracillima* Vasey, Contrib. Nat. Herb. 1 : 272. 1893. SLENDER SPEAR-GRASS.—A smooth, densely tufted, erect perennial, with soft, narrow, flat leaves and open panicles 8 to 10 cm. long. Spikelets (*a*) 3-to 5-flowered, 6 to 8 mm. long, with rather distant florets, acute empty glumes and obtuse flowering glumes, which are 3 to 4 mm. long and scabrous or pubescent on the keel and nerves below.—Dry, rocky soil on ridges and mountain sides, central and northern California to Washington and British Columbia. May–August.



FIG. 555. *Poa cusickii* Vasey, Contrib. U. S. Nat. Herb. 1 : 271. 1893. CUSICK'S BLUE-GRASS.—A. densely caespitose, glabrous perennial, 3 to 4 dm. high, with very narrow leaves and contracted panicles 6 to 10 cm. long. Spikelets (a) 3-to 5-flowered, 8 to 10 mm. long, with acute empty glumes and lanceolate, acute flowering glumes which are 5 to 6 mm. long and finely scabrous on the back, at least below.—In canyons, Oregon and Idaho. May, June.



FIG. 556. *Poa nudata* Scribn., Cir. U. S. Dept. Agr., Div. Agros. 9: 1. Feb. 24, 1899. (*Poa capillaris* Scribn. U. S. Dept. Agr., Div. Agros., Bull. 11: 51, fig. 11. July 20, 1898, not Linn.) FINE-LEAFED BLUE-GRASS.—A slender, erect, densely caespitose perennial 3 to 4 dm. high, with capillary, flexuous basal leaves and long-exserted densely flowered panicles 3 to 5 cm. long. Spikelets 3- to 5-flowered, 7 to 10 mm. long, with broadly lanceolate, acute empty glumes; flowering glumes 4 to 5 mm. long, scabrous on the back, with short, appressed hairs near the base.—California.



FIG. 557. *Poa purpurascens* Vasey, Coult. Bot. Gaz. 6 : 297. 1881. PURPLE-TOP BLUE-GRASS.—A tufted, erect, somewhat wiry perennial, 2.5 to 3.5 dm. high, with flat leaves and rather densely flowered panicles 4 to 6 cm. long. Spikelets ovate, 3- to 5-flowered, 5 to 7 mm. long. Floral glumes obtuse, minutely scabrous on the back and hispid-ciliate on the keel.—Moist hillsides and meadows, California northward to British Columbia. July, August.



FIG. 558. *Poa tenerrima* Scribn. U. S. Dept. Agr., Div. Agros., Cir. 9:4. 1899. SLENDER-FLOWERED BLUE-GRASS.—A very slender, erect, caespitose perennial, 3 to 5 dm. high, with short, filiform leaves and spreading, capillary panicles 7 to 9 cm. long. Spikelets 3- to 4-flowered, about 7 mm. long with acute empty glumes and obtuse flowering glumes, which are smooth excepting for a short, crisp pubescence near the base, and are about 4 mm. long.—California.



FIG. 559. *Poa vaseyochloa* Scribn. U. S. Dept. Agr., Div. Agros., Cir. 9:1. 1899. (*P. pulchella* Vasey.) VASEY'S BLUEGRASS.—A slender, caespitose perennial with short, filiform leaves, smooth, erect culms 1 to 1.5 dm. high, and delicate, open panicles 2 to 3 cm. long. Spikelets 3- to 5-flowered, 6 to 8 mm. long, with short, and usually obtuse outer glumes (a), and scabrous, obtuse, flowering glumes (c).—Moist places among rocks, Idaho, Washington, and Oregon. April, May.



FIG. 560. *Poa argentea* Howell, Bull. Torr. Bot. Club **15**: 11. 1888; Vasey, Ill., N. Am. Grasses, **2**: No. 72. SILVERY BLUE-GRASS.—A slender, smooth, densely caespitose, erect perennial 1.5 to 2.5 dm. high, with flat leaves and narrow, oblong, rather loosely flowered panicles 2 to 4 cm. long. Spikelets (*a*) oblong-lanceolate, 2- to 3-flowered, 6 to 7 mm. long, with thin, oblong, obtuse glumes, the floral ones (*b*) smooth, 4 to 5 mm. long.—In the mountains of western Oregon. July.



FIG. 561. *Poa glumaris* Trin. Mem. Acad. St. Petersburg. (VI) 1:379. 1831. LARGE-FLOWERED BLUE-GRASS.—A stout, erect, smooth perennial 3 to 9 dm. high, from strong, creeping rootstocks, with thick, flat leaves, closely flowered, contracted panicles 8 to 16 cm. long. Spikelets 3- to 5-flowered, 8 to 12 mm. long; with nearly equal, acute, firm, empty glumes (*a*), and broadly-ovate flowering glumes which are 4 to 5 mm. long and pubescent on the margins and keel below, not webbed.—Nova Scotia, Quebec, and westward to Alaska. May–September.



FIG. 562. *Poa douglassii* Nees, Ann. Nat. Hist. 1: 284. 1838. Thurb. in Brewer and S. Wats. Bot. Calif. 2: 314. (*Brizopyrum douglassii* Hook. & Arn.) DOUGLASS' SAND-GRASS.—A slender, tufted perennial, 1.5 to 3 dm. high, from long, creeping rootstocks, with numerous, convolute radical leaves, flat culm leaves, and densely flowered panicles 2 to 4 cm. long. Spikelets 3- to 5-flowered, about 8 mm. long, with acute empty glumes (a c) and acute flowering glumes which are 6 mm. long, ciliate-pubescent on the keel above, and softly hairy or more or less crisped-woolly below.—In sands along the coast, California and northward. May.

An excellent sand binder.



FIG. 563. *Colpodium pendulinum* (Laest.) Griseb. in Ledeb. Flor. Ross. 4 : 386. 1853. NODDING COLPODIUM.—A smooth, erect perennial 6 to 7 dm. high, with flat leaves and open, nodding panicles about 12 cm. long. Spikelets (a) oblong, 4- to 6-flowered, 4 to 6 mm. long, with smooth, nearly equal empty glumes and broadly ovate-oblong flowering glumes which are 3 to 3.5 mm. long, with a few short hairs at the base.—Moist banks, British America and Alaska. [Northern Europe.] July, August.



FIG. 564. *Colpodium fulvum* (Trin.) Griseb. in Ledeb. Flor. Ross., 4: 385. 1853. (*Poa fulva* Trin. Mem. Acad. St. Petersburg. Ser. 1, 6: 378. 1845. *Grapphephorum fulvum* A. Gray). YELLOW COLPODIUM.—A rather stout, erect, leafy, and glabrous perennial, 2 to 6 dm. high, with flat, sharp-pointed leaves and open panicles 8 to 15 cm. long. Spikelets 4- to 6-flowered, 5 to 6 mm. long, with broadly lanceolate empty glumes (*a*) and obtuse flowering glumes about 4 mm. long.—Moist situations, British Columbia to Alaska. [Greenland and Northern Europe.] August.



FIG. 565. *Dupontia psilosantha* Rupr. Flor. Samaj. Cisural. 65, t. 6. 1845. (*Graphephorum fisheri psilosanthum* A. Gray.)
 SLENDER DUPONTIA.—A slender, erect, glabrous perennial 2 to 4 dm. high, from a creeping rootstock, with flat, attenuate-pointed leaves and contracted or, in anthesis, spreading panicles 7 to 12 cm. long. Spikelets 2- to 3-flowered, 6 to 7 mm. long, with broad and usually obtuse empty glumes (*a*) and obovate, obtuse, glabrous flowering glumes.—Newfoundland, Hudsons Bay to Alaska. [Arctic-Siberia.] August, September.



FIG. 566. *Dupontia fischeri* R. Br. in Parry's Voy. App. 291. 1824. FISHER'S DUPONTIA.—A slender, erect perennial 1 to 2.5 dm. high, from a creeping rootstock, with flat, attenuate-pointed leaves and contracted, simple panicles 4 to 7 cm. long. Spikelets 2- to 3-flowered, 6 to 7.5 mm. long, with lanceolate, acute empty glumes (*a*), and obtuse or acute flowering glumes which are silky-pilose on the back toward the base.—Moist situations, Arctic America. [Siberia.] June–August.



FIG. 567. *Scolochloa festucacea* (Willd.) Link. (*Arundo festucacea* Willd. Enum. 1: 126. 1809.) SPRANGLE-TOP.—A stout, erect, glabrous perennial 9 to 15 dm. high, with long, flat leaves and open panicles 16 to 30 cm. long. Spikelets 3- to 5-flowered, 6 to 8 mm. long, with unequal, acute, outer glumes (*a*) and 7-nerved, scabrous flowering glumes which have a tuft of hairs at the base.—Wet grounds or in shallow water, Minnesota, Iowa to Nebraska, and northward. [Northern Europe.] June–August.



FIG. 568. *Panicularia acutiflora* (Torr.) Kuntze. (*Glyceria acutiflora* Torr. Fl. U. S. 1: 104. 1824.) ACUTE-FLOWERED MANNA-GRASS.—A rather slender, glabrous perennial 3 to 6 dm. high, with flat leaves and narrow, simple panicles 15 to 30 cm. long. Spikelets (*a*) narrow, 24 to 42 mm. long, 5- to 12-flowered; empty glumes unequal, acute; flowering glumes scabrous, acute, about 8 mm. long, exceeded by the long-acuminate paleas.—Wet soil and in shallow water, Maine to Ohio, and southward to New Jersey and Tennessee. May, June.



FIG. 569. *Panicularia borealis* Nash, Bull. Torr. Bot. Club, 24: 348. 1897. NORTHERN MANNA-GRASS.—A rather slender, smooth perennial 4 to 15 dm. high, with flat leaves and narrow panicles 12 to 40 cm. long. Spikelets (*a*) 10 to 18 mm. long, 7- to 13-flowered with thin, unequal empty glumes, and obtuse flowering glumes which are hispidulous along the nerves and 4 to 5 mm. long.—Margins of streams and ponds, New England and New York westward to Washington and California. June–September.



FIG. 570. *Panicularia obtusa* (Muhl.) Kuntze (*Poa obtusa* Muhl. Gram. 147. 1817.) DENSELY FLOWERED MANNA-GRASS.—A stout, erect, glabrous grass 3 to 9 dm. high, with rather broad, flat leaves, and contracted, many-flowered panicles 6 to 18 cm. long. Spikelets 3- to 7-flowered, 4 to 6 mm. long, with broad, obtuse flowering glumes (*b*) about 3 mm. long.—Wet, swampy places, New Brunswick to New York and Pennsylvania, south to Virginia and North Carolina. July–October.



FIG. 571. *Puccinellia distans* (Linn.) Parl. Flor. Ital. 1: 367. 1848. (*Poa distans* Linn.) SPREADING SPEAR-GRASS.—A slender, erect, or sometimes decumbent, tufted, glabrous perennial 3 to 6 dm. high, with flat leaves and diffusely spreading panicles, 5 to 18 cm. long, branches often becoming finally deflexed. Spikelets 3- to 6-flowered, 3 to 5 mm. long.—Saline soils, Nova Scotia to New Jersey and Pennsylvania and on the west coast from California to Alaska. [Europe, Asia.] June–August.



FIG. 572. *Puccinellia lemmoni* (Vasey). Scribn. n. comb. (*Poa lemmoni* Vasey, Coulter Bot. Gaz. 3: 1878.) LEMMON'S SPEAR-GRASS.—A tufted, pale green or glaucous perennial, with slender, smooth and somewhat wiry, upright culms 3 to 4.5 dm. high, with numerous, short basal leaves and spreading panicles 6 to 10 cm. long. Spikelets very narrow, 3- to 7-flowered, 4 to 6 mm. long.—Alkali flats, Nevada and California to Vancouver Island, Alberta, and Assiniboia. June, July.



FIG. 573. **Festuca kingii** (S. Wats.) Scribn. U. S. Dept. Agr., Div. Agros. 5 : 36. 1897. (*Festuca confinis* Vasey; *Poa Kingii* S. Wats. Bot. King's Exp. 387. 1871.) KING'S FESCUE.—A stout, erect, strongly caespitose perennial 6 to 9 dm. high, with rigid culms, long, narrow leaves, and contracted panicles 8 to 10 cm. long. Spikelets (a) 3- to 5-flowered, 6 to 8 mm. long, with ovate-lanceolate, acute outer glumes, and scabrous, rather rigid flowering glumes about 6 mm. long.—Dry mountain sides, Montana to Oregon and south to Colorado and Nevada. May–August.



FIG. 574. *Festuca obtusa* Spreng. Mant. Fl. Hal. 34. 1807.
 (*F. shortii* Kunth, Wood's Class Book of Botany, 794. 1861.) SHORT'S
 FESCUE.—A rather stout, erect, glabrous perennial 6 to 12 dm.
 high, with flat leaves and rather narrow, nodding panicles 8 to
 16 cm. long. Spikelets broadly obovate, 3- to 6-flowered, 5 to 6
 mm. long, with the flowering glumes about 4 mm. long.—Open
 woods and thickets, Pennsylvania to Illinois, Tennessee, Kansas,
 Mississippi, and Texas, July, August.



FIG. 575. *Festuca jonesii* Vasey, Contrib. Nat. Herb. 1 : 278. 1893. JONES'S FESCUE.—An erect, usually slender, caespitose, leafy perennial 6 to 12 dm. high, with flat leaves 10 to 24 cm. long and open, nodding panicles 15 to 30 cm. long. Spikelets about 12 mm. long, including the awns, 3- to 5-flowered, with unequal, acute empty glumes (*b*) and narrow flowering glumes about 5 mm. long.—Moist places near springs and borders of woodlands in the mountains, Wyoming, Utah, California to Vancouver Island, and Alaska. June–August.



FIG. 576. *Festuca dasyclada* Hackl. in Beal, Grasses N. Am. 2:602. 1896. HACKEL'S FESCUE.—A slender perennial 2 to 4 dm. high, the culms often geniculate below, with smooth sheaths, narrow leaves, and ovoid-pyramidal panicles 7 to 12 cm. long. Spikelets usually 2-flowered, about 7 mm. long, with acute empty glumes (*b*) and scabrous, short-awned flowering glumes (*a*) about 6 mm. long.—Southern California and (?) Utah.



FIG. 577. *Festuca ovina* Linn. Sp. Pl. 73. 1753. SHEEP'S FESCUE.—A slender, densely tufted, erect perennial 2 to 6 dm. high, with narrow or filiform, involute leaves and contracted (expanding while in bloom) panicles 3 to 6 cm. long. Spikelets 3- to 5-flowered, with unequal empty glumes (*a*), and usually short-awned, smooth flowering glumes 3 to 4 mm. long. — New England to Pennsylvania, and westward to the Pacific; especially abundant in many varieties in the Rocky Mountain region. June-September.



FIG. 578. *Festuca microstachys* Nutt. Journ. Acad. (n. ser.) 1: 187. 1848; Vasey Ill. N. Am. Grasses, 2: 91.) SMALL-TOPPED FESCUE.—A slender, caespitose annual 1 to 4 dm. high, with narrow, filiform leaves and simple, racemose or spike-like panicles 2 to 10 cm. long. Spikelets 1- to 5-flowered with nearly equal empty glumes and awned flowering glumes 4 to 6 mm. long; awn 6 to 10 mm. long.—Utah, Nevada, and Idaho to Vancouver Island, southward to Arizona and southern California. April-June.



FIG. 579. *Festuca sciurea* Nutt. Trans. Amer. Phil. Soc. 5 · 147. 1837.—A slender, erect, caespitose annual 1.5 to 5 dm. high, with short, filiform leaves and narrow, simple panicles 5 to 20 cm. long. Spikelets 4 to 6 mm. long, 3- to 7-flowered, with unequal empty glumes (*a*), the second 3-nerved, and very narrow flowering glumes which are pilose, especially above, and terminate in slender awns 8 to 12 mm. long.—Arkansas, Indian Territory, Mississippi, and Texas.

Distinguished from *F. octoflora* by its pilose flowering glumes and longer awns.

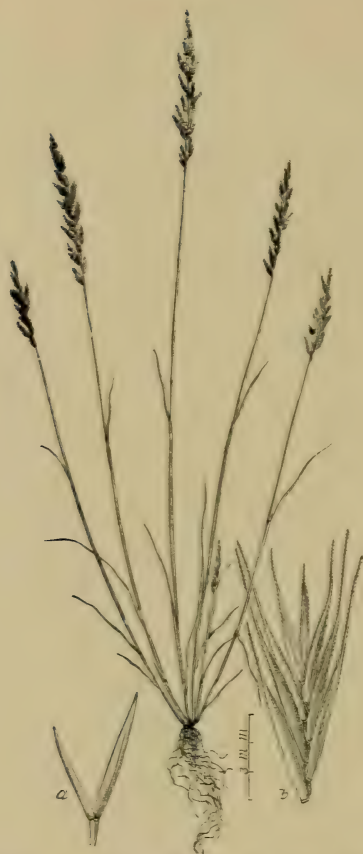


FIG. 580. *Festuca octoflora* Walt. Flor. Carol. 81. 1788. (*Festuca tenella* Willd. Enum. 1: 113. 1809.) SLENDER FESCUE.—A slender, erect, more or less caespitose annual 1 to 5 dm. high, with narrow, simple panicles 2 to 15 cm. long. Spikelets 5- to 13-flowered, 6 to 10 mm. long, with slightly unequal, acute empty glumes (a) and narrow, usually scabrous, short-awned or nearly awnless flowering glumes 3 to 5 mm. long.—Dry, sandy, gravelly, or rocky soil from Canada to Florida, and westward to Washington and California. May–August.



FIG. 581. *Festuca myuros* Linn. Sp. Pl. 74. 1753. RAT'S-TAIL FESCUE.—A smooth, slender, erect annual 3 to 6 dm. high, with narrow, involute leaves and contracted, usually one-sided panicles 8 to 24 cm. long. Spikelets 3- to 6-flowered, with very unequal, acute empty glumes (*a*), and narrow, scabrous, slender-awned flowering glumes 4 to 6 mm. long. Awns much longer than the glumes.—Fields and waste places, Massachusetts to Florida, and westward to California and Washington. [Europe.] April–July.



FIG. 582. *Bromus hookerianus* Thurb. in Bot. Wilkes Expl. Exped. 2: 493. 1874. (*Ceratochloa grandiflora* Hook. Flor. Bor. Am. 2: 253. 1840.) GREAT WESTERN BROME.—A stout, erect perennial 3 to 12 dm. high, with pubescent or hirsute sheaths and leaves and nearly simple, lax panicles 20 to 35 cm. long. Spikelets 35 to 50 mm. long, 9- to 13-flowered, strongly compressed, scabrid-pubescent, with sharply acuminate-pointed empty glumes and 9-nerved, short-awned flowering glumes; these more remote, less compressed, and much longer awned than in *B. breviaristatus*.—California to Washington, and eastward to Montana.



FIG. 583. *Bromus ciliatus* Linn. Sp. Pl. 77. 1753. SWAMP CHESSE.—A stout, erect, leafy perennial, 6 to 12 dm. high, with flat leaves and open, nodding panicles 10 to 25 cm. long. Spikelets 5- to 8-flowered, 10 to 20 mm. long, with acute outer glumes, the first 1-nerved, the second 3-nerved, and short-awned flowering glumes, which are ciliate-pubescent near the margins and 8 to 10 mm. long.—Open woodlands and borders of thicket, Canada, British Columbia, and southward to Florida and Texas. June-September. A widely distributed native grass of little agricultural value.



FIG. 584. **Bromus kalmii** A. Gray, Man. 600. 1848. KALM'S BROME-GRASS.—A rather slender, erect perennial, 4.5 to 9 dm. high, with usually pubescent sheaths and leaves, and nodding, few-flowered panicles 5 to 15 cm. long. Spikelets 6- to 10-flowered, 12 to 24 mm. long, on slender, flexuous pedicels; the first glume 3-nerved, the second 5- to 7-nerved; the flowering glume about 8 mm. long, densely silky-pubescent, and short-awned.—Dry soil, Canada to Pennsylvania, and westward to Utah, Idaho and British Columbia. June-August.



FIG. 585. **Bromus hordeaceus** Linn. Sp. Pl. 77. 1753. (*B. mollis* Linn. Sp. Pl. Ed. 2, 112. 1762.) SOFT CHESS.—An erect, usually slender, pubescent annual, 2 to 6 dm. high, with flat leaves and contracted panicles 2 to 6 cm. long. Spikelets 3-to 8-flowered, 1.5 to 2 cm. long, with pubescent glumes, the flowering ones 7 to 9 mm. long, obtuse and awned. Awns 6 to 8 mm. long.—In fields and waste places throughout. [Adventive from Europe.] May-August.



FIG. 586. *Bromus tectorum* Linn. Sp. Pl. 77. 1753. DOWNY BROME-GRASS.—A slender, erect, leafy annual, 1.5 to 6 dm. high, with narrow, softly pubescent leaves and open, nodding panicles 6 to 15 cm. long. Spikelets 5- to 8-flowered, with unequal, acuminate-pointed, hirsute empty glumes, and rough or hirsute flowering glumes 8 to 12 mm. long. Awns 12 to 16 mm. long.—Waste places, New England to Virginia and Ohio; also California to Washington. A weed, introduced from Europe.



FIG. 587. *Lolium temulentum* Linn. Sp. Pl. 83. 1753. DARNEL.—A glabrous, erect, and usually rather stout annual, 6 to 12 dm. high, with flat leaves and erect spikes 10 to 30 cm. long. Spikelets 4- to 8-flowered, 10 to 18 mm. long, the empty glume (*a*) as long as or exceeding the spikelet.—Waste places and cultivated grounds. A weed, introduced from Europe. May–August.



FIG. 588. *Lepturus filiformis* (Roth) Trin. Fund. Agros. 123. 1820. (*Rottboellia filiformis* Roth, Catal., 1: 21. 1797.) **SLENDER HARD-GRASS.**—A slender and rather rigid, much-branched annual, 1 to 3 dm. high, with narrow, flat leaves, and slender, erect, or curved spikes 2 to 12 cm. long. Spikelets 4 to 5 mm. long, with acute empty glumes and 1-nerved flowering glumes 3.5 mm. long.—Waste places, southern Pennsylvania to Virginia. Introduced from Europe. May–July.



FIG. 589. *Lepturus incurvatus* (Linn.) Trin. Fund. Agros. 123. 1820. (*Aegilops incurrata* Linn. Sp. Pl. 1: 1051. 1753; *Rottbællia incurrata* Linn. Suppl. 114.) CURLY HARD-GRASS.—A low, much branched annual 1 to 2 dm. high, with narrow leaves and usually strongly incurved spikes 2 to 8 cm. long. Spikelets about 6 mm. long, the acute empty glumes much exceeding the hyaline floral glume.—Borders of brackish marshes, Maryland to southern Virginia, New Jersey (on ships' ballast) and California. Introduced from Europe.



FIG. 590. *Agropyron parishii* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4 : 28. 1897. PARISH'S WHEAT-GRASS.—A rather stout, erect, caespitose perennial 6 to 10 dm. high, with flat leaves and erect or nodding spikes, 15 to 30 cm. long. Spikelets remote, 5- to 7-flowered, 16 to 20 mm. long. Empty glumes (*a*) two-thirds as long as the spikelets. Flowering glumes lanceolate, 9 to 11 mm. long, short-awned.—San Bernardino Mountains, California. May, June.



FIG. 591. **Agropyron violaceum** (Hornm.) Vasey. (*Triticum violaceum* Hornm. Fl. Dan. t. 2044. 1832.) 1883. NORTHERN WHEATGRASS.—An erect, caespitose perennial, with rather short, flat leaves and comparatively stout spikes 2 to 6 cm. long. Spikelets 3- to 4-flowered, with short-awned or awnless glumes, which are broadest above the middle.—Labrador and southward in the mountains of New England, New York, and Pennsylvania, westward to Colorado and Utah, and northward to Alaska. June–September.



FIG. 592. *Agropyron pseudorepens* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4: 34. 1897. FALSE COUCH-GRASS.—An erect, rather stout perennial 3 to 9 dm. high, from creeping rootstocks, with flat, scabrous leaves, and erect spikes 8 to 16 cm. long. Spikelets 10 to 16 mm. long, 3- to 7-flowered, with linear-lanceolate, nearly equal and 5-nerved empty glumes, and acuminate or awn-pointed flowering glumes.—Rather moist soil, Texas and Arizona to Nebraska, Montana, and British America. May-September.



FIG. 593. *Agropyron tenerum* Vasey, Coult. Bot. Gaz. 10: 258. 1885. SLENDER WHEAT-GRASS.—An erect, caespitose, rather stout, smooth perennial 6 to 9 dm. high, with narrow, flat leaves and slender, cylindrical spikes 8 to 15 cm. long. Outer glumes (a) 5-nerved; flowering glumes lanceolate 8 to 10 mm. long, tipped with a stiff, straight awn 1 to 4 mm. long.—Dry soil, New Mexico and southern California to Washington and British Columbia, and eastward to New Hampshire and Labrador. July, August.



FIG. 594. *Agropyron spicatum* (Pursh) Scribn. & Smith, Bull. U. S. Dept. Agr., Div. Agros. 3:12. 1896. COLORADO BLUE-STEM. WESTERN WHEAT-GRASS.—A rigid, upright, glaucous perennial 3 to 12 dm. high, from creeping rootstocks, with rather firm, bluish-green leaves, and straight, beardless spikes 6 to 14 cm. long. Spikelets 7- to 13-flowered, 12 to 20 mm. long, with lanceolate, acuminate-pointed, empty glumes (*a*), and acute flowering glumes 8 to 12 mm. long.—Dry or moist soil, Wisconsin to Iowa, and westward to Washington, Texas, and Arizona. June–September.



FIG. 595. **Agropyron riparium** Scribn. & Smith, U. S. Dept. Agr., Div. Agros., Bull. 4 : 35. 1897. RIVER-SIDE WHEAT-GRASS.—A rather slender, tufted, glaucous perennial, 4.5 to 6 dm. high, with narrowly involute leaves, pubescent sheaths, and densely flowered spikes 5 to 8 cm. long. Spikelets 5- to 7-flowered, 10 to 12 mm. long, awnless. Empty glumes (*a*) less than one-half as long as the spikelet.—River banks, Montana. July, August.



FIG. 596. *Agropyron lanceolatum* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull., 4: 34. 1897. (*Triticum junceum* Hook. Not Linn.)—A rather stout, yellowish-green or glaucous perennial 6 to 9 dm. high, with long, flat leaves, with erect or flexuous spikes of large, subcompressed, acute, 4- to 7-flowered spikelets 10 to 20 mm. long. Empty glumes (*a*) abruptly acuminate, 6 to 9 mm. long; flowering glumes (shown in *b*) broadly lanceolate, rounded on the back and more or less pubescent.—Idaho to Oregon and Washington. May-July.



FIG. 597. *Agropyron richardsoni* Schrad. Linnæa **12**:467. 1838, (fide Kew Index); (*Triticum richardsoni* Trin. in Reliq. in Schrad., Linn. **12**:467. 1838.) RICHARDSON'S WHEAT-GRASS.—An erect, smooth perennial, 6 to 8 dm. high, with rather rough, involute-pointed leaves and erect, usually one-sided, bearded spikes, 7 to 10 cm. long. Spikelets 3- to 4-flowered, with long-awned flowering glumes 8 to 9 mm. long.—Dry soil, Nebraska and Minnesota to the Saskatchewan, and south to Colorado. June-September.



FIG. 598. *Agropyron vaseyi* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4: 27. 1897. VASEY'S BUNCH-GRASS.—A slender, wiry, erect, densely caespitose perennial 3 to 4.5 dm. high, with short, involute, setaceous leaves, and few-flowered, interrupted spikes 4 to 8 cm. long. Spikelets rather remote, 3- to 5-flowered, 8 to 10 mm. long. Empty glumes awnless; flowering glumes with a divergent awn 8 to 10 mm. long.—Dry, gravelly soil, Montana and Nevada to Oregon and Washington. May-August.



FIG. 599. **Agropyron divergens** Nees in Steud. Syn. Pl. Gram. 347. 1855. (*Triticum divergens* Steud.) WIRE BUNCH-GRASS.—A rigid and often wiry, densely tufted perennial 3 to 9 dm. high, with narrow, flat, or involute leaves, and terminal, usually erect spikes 8 to 20 cm. long. Spikelets rather distant, 3- to 6-flowered, with rigid and usually acute empty glumes (a) about one-half as long as the spikelet. Flowering glumes 8 to 10 mm. long with widely divergent arms.—Dry, rocky soil and bench lands, Washington and Oregon to Montana, Colorado and Nevada. June-August.



FIG. 600. *Agropyron arizonicum* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4: 27. 1897. ARIZONA WHEAT-GRASS.—A glaucous, erect perennial 4.5 to 6 dm. high, with soft, flat leaves 15 to 18 cm. long, nodding spikelets 12 to 22 cm. long, and rather remote, 5- to 7-flowered spikelets, 18 to 24 mm. long. Empty glumes (*a*) about one-half as long as the spikelets; flowering glumes long-awned; awn divergent, about 24 mm. long.—Mountains, New Mexico and Arizona. [Mexico.] August, September.



FIG. 601. *Agropyron gmelini* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. 8 Bull. 4 : 30. 1897. SHORT-LEAFED WHEATGRASS.—A rather slender, erect, glabrous, caespitose perennial, 6 to 12 dm. high, with flat leaves, the lower ones short, and slender spikes 8 to 20 cm. long. Spikelets 7- to 9-flowered, 12 to 18 mm. long; empty glumes (*a*) unequal, two-thirds as long as the spikelet. Flowering glumes 10 to 12 mm. long, shorter than its slender awn.—Moist soil, mountains, Washington to western Nebraska. May–August.



FIG. 602. **Secale montanum** Guss. Flor. Sic. Prod. 145. 1827.
MOUNTAIN RYE.—A fibrous-rooted, erect, glabrous perennial, 9 to 12 dm. high, with flat leaves and nodding, somewhat compressed spikes 6 to 10 cm. long. Spikelets about 15 mm. long, with very narrow, awnless, or short-awned empty glumes and ciliate, 5-nerved, awned flowering glumes; awns 28 to 30 mm. long.—Sparingly introduced into cultivation. July.

Probably a good hay grass.



FIG. 603. *Hordeum jubatum* Linn. Sp. Pl. 85. 1753. SQUIRREL-TAIL GRASS.—A smooth, slender, and erect perennial (?), 2 to 6 dm. high, with flat leaves, and long-bearded, nodding spikes 5 to 10 cm. long. Empty glumes awn-like, 3 to 5 cm. long, the flowering glume of the central spikelet 6 to 8 mm. long, terminating in a slender awn 3 to 5 cm. long.—Moist saline soils, Canada, the United States south to Kansas, Colorado, and California. Alaska. May–August.



FIG. 604. *Hordeum maritimum* With. Bot. Arr. 172. 1776. Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4 : p. 24. 7189. SEASIDE BARLEY.—A smooth, upright, or spreading, caespitose annual, 1 to 3 dm. high, with short leaves and terminal, bearded spikes 2 to 4 cm. long. Spikelets, including the rigid, spreading awns, 10 to 12 mm. long, the outer glumes not ciliate.—Sandy soil along the coast, British Columbia to southern California. [Naturalized from Europe.] May–July.



FIG. 605. **Hordeum murinum** Linn. Sp. Pl. 85. 1753. WALL BARLEY.—A rather stout, caespitose annual, 3 to 6 dm. high, with short, flat leaves, inflated sheaths, and compressed spikes 5 to 10 cm. long. Spikelets, including the awns, 4 cm. long, the glumes of the middle spikelet lanceolate and conspicuously ciliate on the margins.—On ballast New York, New Jersey, and Delaware, and along the Pacific coast from British Columbia to southern California. [Europe.] April-July.



FIG. 606. *Hordeum gussonianum* Parl. Pl. Palerm. in obs. 244. 1845.—A slender, caespitose, erect or ascending annual, 1 to 3 dm. high, with short leaves and spikes. Empty glumes subulate, long-awned, the inner pair distinctly flattened. Resembling *H. maritimum* in habit.—California and Oregon. [Europe.] May, June.



FIG. 607. *Hordeum adscendens* HBK. Nov. Gen. 1: 180. 1815. Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 4: 24. 1897.—A rather slender, erect, leafy annual (?) 6 to 9 dm. high, with pubescent lower sheaths, flat and rather rigid leaves, and bearded, terminal spikes 6 to 8 cm. long. Empty glumes setaceous, rounded on the back, grooved on the inner face below; those of the central spikelet about 2 cm. long. Flowering glume of the central spikelet 9 to 10 mm. long, with an awn 20 to 24 mm. long. Lateral spikelets neutral.—Along irrigating ditches, Arizona. [Mexico.] April–June.



FIG. 608. *Hordeum montanense* Scribn. in Beal Grasses N. Am. 2: 614. 1896. MONTANA BARLEY.—An erect, leafy biennial or perennial 6 to 9 dm. high, with smooth culms, scabrous leaves and bearded spikes 4 to 6 cm. long. Empty glumes linear-lanceolate, 12 to 20 mm. long, including the slender, scabrous awns. The central spikelet of each group usually 2-flowered. First flowering glume about 10 mm. long, awned. Awn 16 to 18 mm. long. Lateral spikelets 2-flowered, florets nearly sessile.—Moist thickets, Montana.



FIG. 609. *Hordeum nodosum* Linn. Sp. Pl. Ed. 2, 56. 1762.
 WILD OR MEADOW BARLEY.—A slender, erect, caespitose grass 2 to 6 dm. high, with flat leaves, and narrow, bearded spikes 2 to 8 cm. long. Empty glumes all setaceous or awn-like; lateral spikelets imperfect. Awns 6 to 12 mm. long.—Thin, dry soils, Indiana and Minnesota to Alaska, and south to Tennessee, Mississippi, Texas, and California. May–August.



FIG. 610. *Hordeum pusillum* Nutt. Gen. 1: 87. 1818. LITTLE BARLEY.—A slender, rather rigid, erect, glabrous perennial, 1 to 3.5 dm. high, with comparatively short, flat leaves, and terminal spikes 2 to 7 cm. long. Outer glumes of the central spikelets and lower ones of the lateral spikelets much broadened above the base.—Arid, saline, or alkaline soils from Ontario to British Columbia and south to South Carolina, Louisiana, and Texas. April–August.



FIG. 611. *Elymus striatus* Willd. Sp. Pl. 1: 470. 1797. SLENDER LYME-GRASS.—A rather slender, erect, leafy perennial with flat leaves and slender, bearded, somewhat nodding spikes 7 to 10 cm. long. Spikelets 1- to 3-flowered, with awl-shaped, hispid or hirsute empty glumes and scabrous, slender-awned flowering glumes about 6 mm. long. Awns 16 to 30 mm. long.—Woods and river banks, Maine to South Dakota and south to New Jersey, Tennessee, Arkansas, and Texas. June–August.



FIG. 612. *Elymus virginicus* Linn. Sp. Pl. 84. 1753. TERRELL-GRASS.—A rather stout, leafy, erect, glabrous perennial 6 to 10 dm. high, with terminal, erect spikes 4 to 14 cm. long, the bases of which are usually inclosed in the inflated uppermost sheath. Spikelets with thick and rigid, lanceolate empty glumes 16 to 24 mm. long (including the short awn).—Moist soil, borders of thickets and open woodlands, Nova Scotia and New Brunswick to Florida, and westward to Manitoba and Texas. June-September.



FIG. 613. *Elymus robustus* Scribn. & Smith. U. S. Dept. Agr., Div. Agros. Bull. 4: 37. 1897. GREAT LYME-GRASS.—A stout, leafy perennial 9 to 18 dm. high, with thick, terminal, long-bearded spikes 10 to 14 cm. long. Spikelets 3- to 4-flowered, with linear-subulate empty glumes and scabrous or pubescent flowering glumes. Awns spreading 3 to 4 cm. long.—Rich moist soil, Illinois, and Montana to Kansas and New Mexico. June-September.



FIG. 614. *Elymus macounii* Vasey, Bull. Torr. Bot. Club, **13**: 119. 1886. MACOUN'S LYME-GRASS.—A slender, upright, smooth, caespitose perennial 3 to 8 dm. high, with narrow, erect leaves and slender, nearly cylindrical spikes 6 to 10 cm. long. Spikelets 1- to 3-flowered, with narrowly lanceolate empty glumes (*a*) 8 to 10 mm. long.—Rather moist soil, South Dakota to Colorado and Montana. [British Columbia.] June-August.



FIG. 615. *Elymus salinus* Jones, Proc. Cal. Acad., ser. 2, 5: 725. 1895. ALKALI LYME-GRASS.—A rigid, wiry, erect, densely caespitose perennial 3 to 6 dm. high, with rather rigid, involute, spreading leaves and narrow, erect spikes 5 to 10 cm. long. Spikelets usually single at each joint, about 12 mm. long and 5- to 9-flowered. Empty glumes (*a*) nearly subulate, unequal; flowering glumes short-awned, about 8 mm. long.—Alkali soil, Utah and Wyoming. June-August.



FIG. 616. *Elymus simplex* Scribn. and Williams. U. S. Dept. Agr., Div. Agros. Bull. 11:57, pl. 17. 1898. SALT LYME-GRASS.—A wiry, erect perennial, 3 to 4 dm. high, from strong, creeping rootstocks, with flat (finally involute) pungently-pointed, rigid leaves and densely-flowered, erect spikes 5 to 8 cm. long. Spikelets solitary or in pairs, 5- to 7-flowered, about 15 mm. long, with very rigid and subulate-pointed empty glumes and smooth flowering glumes, which are about 7 mm. long, with rigid awns 5 to 6 mm. long.—Borders of ponds, Wyoming. July, August.



FIG. 617. *Elymus condensatus* Presl, Reliq. Haenk. 1:265. 1830. GIANT RYE-GRASS.—A stout, erect perennial 10 to 24 dm. high, often growing in great clumps or bunches, with long, rather rigid, flat leaves and dense spikes 10 to 30 cm. long. Spikelets 3 to 6 flowered, with subulate empty glumes (*a*) and smooth, mucronate-pointed flowering glumes 8 to 10 mm. long.—Usually moist and alkaline soils, Nebraska and the Dakotas to Washington and Oregon, south to Arizona and California. June–September.



FIG. 618. *Elymus flavescens* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 8: 8, fig. 1. 1897. YELLOW-HAIRED LYME-GRASS.—A stout, erect perennial 6 to 10 dm. high, from long, creeping rootstocks, with long, somewhat rigid leaves and rather loosely-flowered yellowish spikes 10 to 20 cm. long. Spikelets 3- to 6-flowered, 10 to 20 mm. long, densely villous, with long whitish or yellowish hairs. Glumes awnless, the outer ones very unequal and glabrous.—Dry sandy soil, Idaho to Oregon and Washington. May, June.



FIG. 619. *Elymus innovatus* Beal, Grasses of North America, 2: 650. 1896. (*Elymus brownei* Scribn. & Smith, U. S. Dept. Agr., Div. Agros. Bull. 8: 7, Pl. IV.) BROWN'S WILD RYE.—A rigid, rather slender, erect perennial 5 to 9 dm. high, with short cauline leaves, and densely flowered, pubescent spikes 4 to 10 cm. long. Spikelets 3- to 6-flowered, 10 to 15 mm. long, with densely pubescent flowering glumes 8 to 10 mm. long.—Gravelly or sandy banks, South Dakota, Wyoming, British Columbia, and northward to Alaska. June–September.



FIG. 620. *Elymus hirsutiglumis* Scribn. U. S. Dept. Agr., Div. Agros. Bull. 11: 58. 1898. (*E. intermedius* Scribn. & Smith, U. S. Dept. Agr., Div. Agros, Bull. 4: 38. 1897. Not *E. intermedius* Bieb., Flor., 1: 82.) HAIRY-FLOWERED LYME-GRASS.—A rather stout, erect, leafy perennial 6 to 9 dm. high, with smooth culms and sheaths, and erect, slender spikes 3 to 8 cm. long. Empty and flowering glumes awn-pointed; awns 8 to 16 mm. long.—Maine to Virginia and westward to Illinois and Nebraska. July, August.



FIG. 621. *Elymus dasystachys littoralis* (Pall.) Griseb. Ledeb. Flor. Ross. 4: 333. 1853. Scribn. U. S. Dept. Agr., Div. Agros. Bull. 8: 8. (*Triticum littorale* Pall. It. 3: 287.) 1776.—A stout, erect perennial 8 to 10 dm. high, from strong, creeping rootstocks, with long, sharp-pointed leaves, and loosely flowered, often branched spikes 20 to 30 cm. long. Spikelets 5- to 9-flowered, with rigid, narrowly lanceolate empty glumes (*a*), and acute flowering glumes which are 12 to 14 mm. long and pubescent on the back, excepting near the apex.—Washington and Idaho. August.



FIG. 622. *Elymus villosissimus* Scribn. sp. nov. NORTHERN LYME-GRASS.—A stout, erect perennial 3 to 4 dm. high from a strong, creeping rootstock, with rather broad, comparatively short, flat leaves, and short, densely flowered panicles 5 to 7 or 8 cm. long. Spikelets (*a*) 3-to 5-flowered, about 15 cm. long, with densely villous or lanate glumes, the outer ones narrowly lanceolate and subulate-pointed, nearly equaling the spikelet. Ligule nearly obsolete.—Uplands, St. Paul Island, Bering Sea; also Wrangell Island, Arctic America.

Type specimen from St. Paul Island, James M. Macoun (16226). July, August.



FIG. 623. *Elymus saundersii* Vasey, Bull. Torr. Bot. Club, 2: 126. 1884. SAUNDERS LYME-GRASS.—A slender, tufted, erect perennial 6 to 10 dm. high, with narrow, rather rigid leaves and long-bearded spikes, 10 to 14 cm. long. Spikelets 2-to 4-flowered; awns of the glumes slender, 40 to 50 mm. long; lower flowering glume about 10 mm. long, 2-toothed at the apex.—Veta Pass, Colorado.

Axis of the spike readily breaking up, as in *Sitanion*.



FIG. 624. **Sitanion hanseni** (Scribn.) J. G. S. n. comb. (*Elymus hanseni* Scribn., U. S. Dept. Agr., Div. Agros. Bull. 11: 56, fig. 12 1898). **HANSEN'S SITANION**.—A rather stout, glabrous perennial 9 to 12 dm. high, with narrow, spreading leaves and slender, fragile spikes 5 to 8 cm. long. Leaves 10 to 30 cm. long. Spikelets 3- to 5-flowered, about 15 mm. long, exclusive of the awns, which are 2 to 5 cm. long. Empty glumes tipped with 2 or sometimes 3 unequal awns, the longer ones often 3.5 cm. long.—Dry, open grounds, Amador County, California.



FIG. 625. *Sitanion glaber* J. G. Smith. sp. nov. ORCHARD BARLEY.—A rather stout, erect, densely caespitose perennial, 3 to 5 dm. high, with the sheaths and under side of the leaves glabrous, the long-bearded spikes 5 to 8 cm. long. Awns of the floral glumes 40 to 50 mm. long.—California to Washington.

Type No. 914, Coville and Funston, from Coso Mountains, California.



FIG. 626. *Asperella californica* (Bol.) Beal, Grasses N. Am. 2 : 657. 1896. (*Gymnostichum californicum*, Boland. Cat. 35. 1870.) CALIFORNIA BOTTLE-BRUSH.—A stout, erect perennial, 10 to 20 dm. high, with hirsute lower sheaths, broad, flat leaves, and terminal, bearded spikes 15 to 25 cm. long. Spikelets 1- to 3-flowered, with nearly obsolete empty glumes and strongly hispid flowering glumes terminated in a stout, rough awn nearly as long as the glume itself.—California.



FIG. 627. *Arundinaria macrosperma* Michx. Flor. Bor. Am. 1: 74. 1803. CANE.—A stout, woody, almost arborescent grass 45 to 90 dm. high, with lanceolate leaves and lateral panicles composed of a few simple racemes. Spikelets 25 to 45 cm. long, 5- to 9-flowered, with short empty glumes and lanceolate, short-awned, flowering glumes about 16 mm. long.—North Carolina to Florida and westward to Texas.



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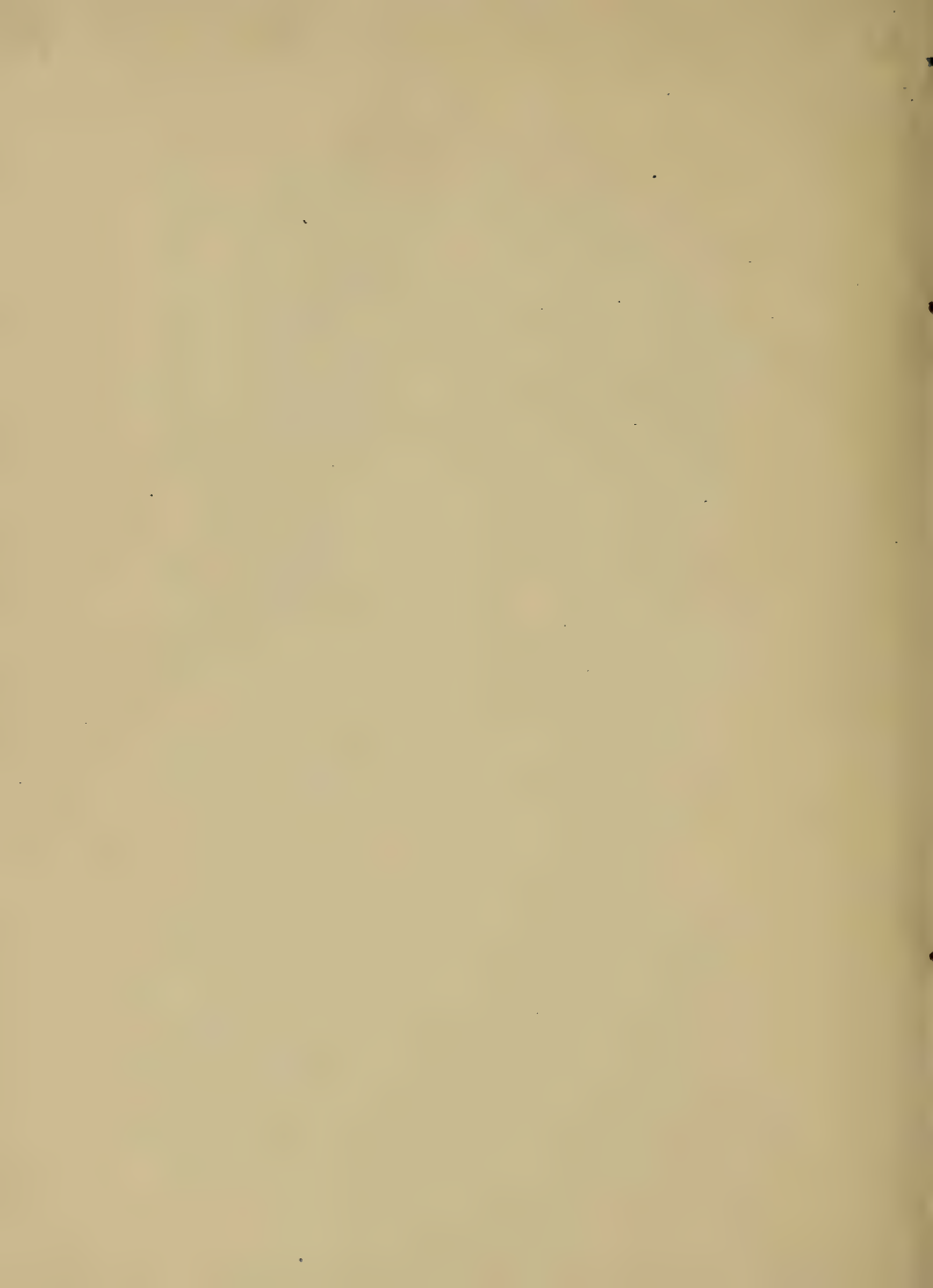
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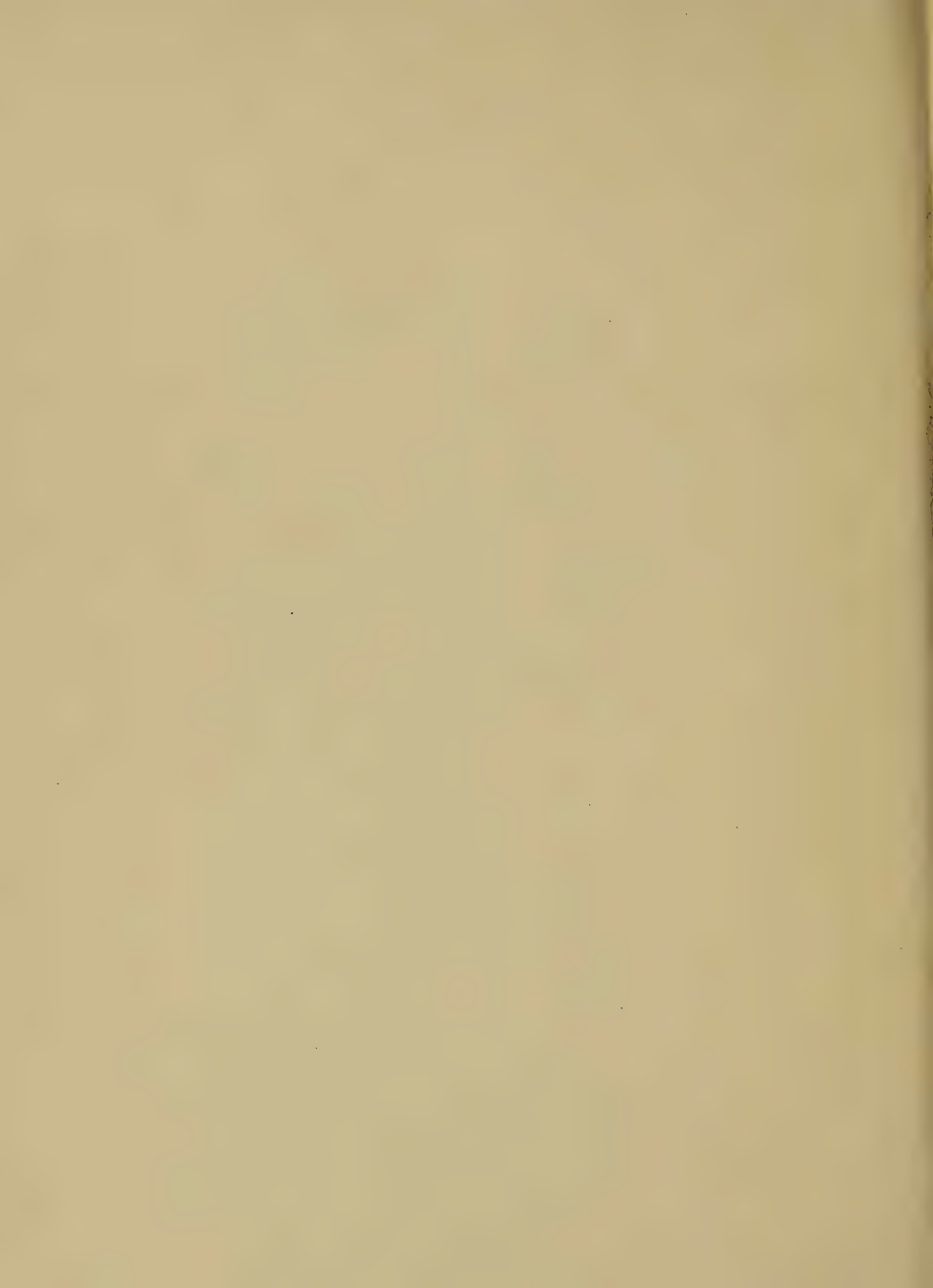
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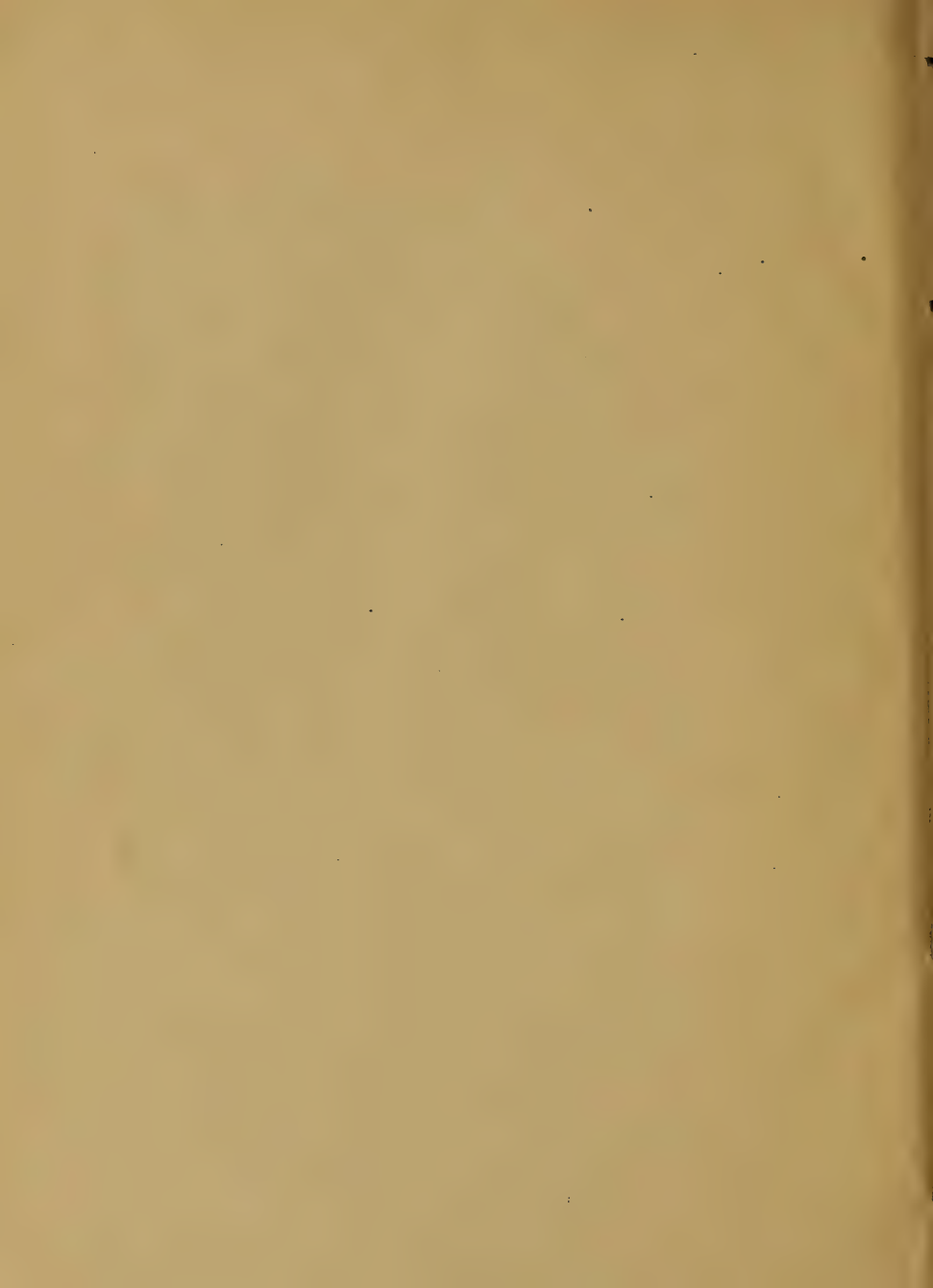
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